SHARP® SERVICE MANUAL

S4109R8R51PHW

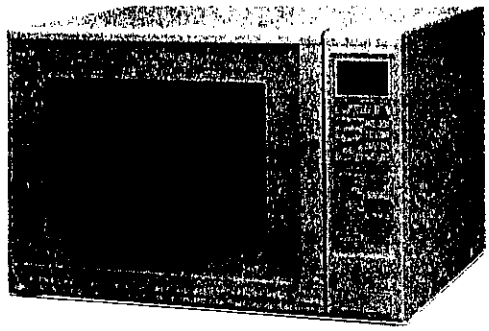

Photo R-8R51(W)

GRILL AND CONVECTION MICROWAVE OVEN

MODELS R-8R51(W) R-8R51(B)

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.
(RD16101U)

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SHARP CORPORATION

[redacted]

R-8R51(W)
R-8R51(B)

SERVICE MANUAL

SHARP

GRILL AND CONVECTION MICROWAVE OVEN

R-8R51(W)/ R-8R51(B)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

(RD36106U)

CAUTION
MICROWAVE RADIATION

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

(RD36203U)

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

(RD51110u)

SHARP CORPORATION

OSAKA, JAPAN

(RD37201U)

PRODUCT SPECIFICATIONS
APPEARANCE VIEW
OPERATING SEQUENCE
FUNCTION OF IMPORTANT COMPONENTS
TROUBLESHOOTING CHART
TEST PROCEDURE
TOUCH CONTROL PANEL ASSEMBLY
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE
MICROWAVE MEASUREMENT
TEST DATA TABLE AND TEST POINT ON CONTROL UNIT
WIRING DIAGRAM
PRINTED WIRING BOARD
PARTS LIST

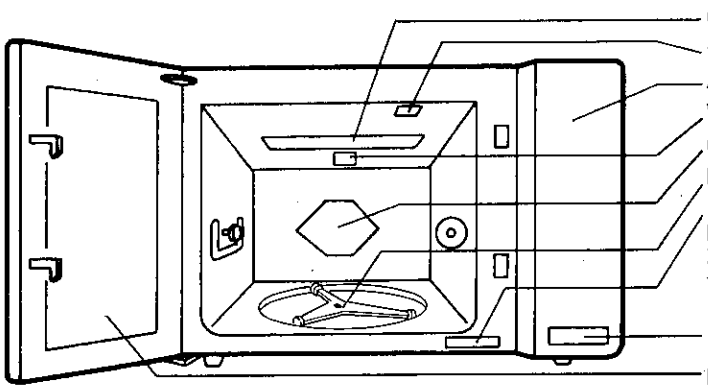
PRODUCT SPECIFICATIONS

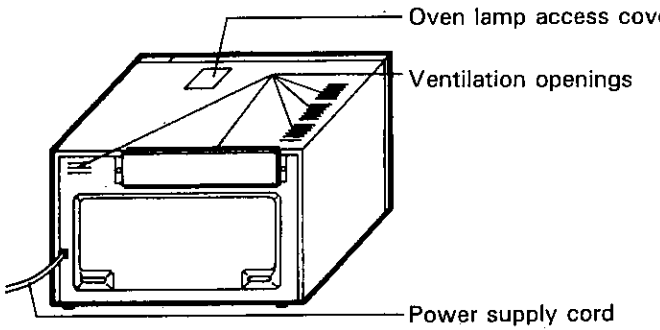
ITEM	DESCRIPTION
Power Requirements	220 – 230 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1.46 kW Approx. 6.7A Dual cooking 1 2.96 kW Approx. 13.5A Dual cooking 2 2.46 kW Approx. 11.2A Convection cooking 1.6 kW Approx. 7.3A Grill cooking Max 2.6kW
Power Output	850 watts nominal of RF microwave energy (method of IEC705) Operating frequency of 2450MHz
Convection Heating Element Power Output	1.5kW
Grill Heating Element Power Output	1.0kW
Case Dimensions	Width 555 mm Height 390 mm including foot Depth 525 mm
Cooking Cavity Dimensions	Width 375 mm Height 252 mm Depth 385 mm
Turntable diameter	365mm
Control Complement	Touch Control System Timer (0 - 99 min. 90 sec.) Microwave Cooking Control Repetition Rate; HIGH ..... Full power throughout the cooking time MED HIGH ..... approx. 70% of Full Power MED ..... approx. 50% of Full Power MED LOW (DEFROST) ..... approx. 30% of Full Power LOW ..... approx. 10% of Full Power Convection Temperature Control Range; 40°C, 70°C, 100°C, 130°C, 160°C, 180°C, 200°C, 220°C, 230°C, 250°C TIME keys DUAL COOK SELECTION key CONVECTION MODE/TEMPERATURE SETTING key MICROWAVE MODE/POWER SETTING key GRILL MODE key ROTISSERIE COOKING key EASY REHEAT key EASY DEFROST key AUTO COOK key WEIGHT (NUMBER) ENTRY keys MORE(▲)/LESS(▼) keys MINUTE TIMER/HOLD key AUTO START/CLOCK SETTING key STOP/CLEAR key MINUTE PLUS/START key
Set Weight	Approx. 29 kg

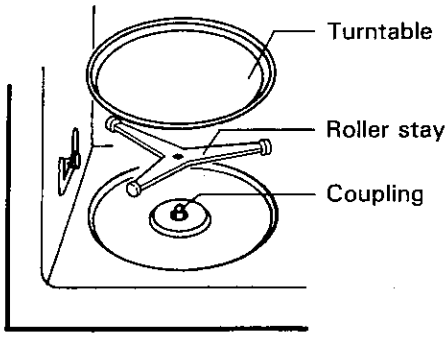
(RD44101U)

NOTE: Numbers and letters shown after sentences such as "RD44101U" are for factory use only.

APPEARANCE VIEW


Grill heating element
Oven lamp
Auto-Touch control panel
Waveguide cover
Convection heating element
Roller stay
Menu sticker for Easy Defrost and Easy Reheat. This is not sticked. This sticker is an oven accessory and must be fixed on this place.
Door open button ( )
Door



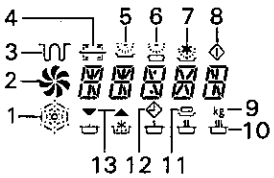


Place the roller stay on the coupling in such way that the letters "Top" on the roller stay face upwards.

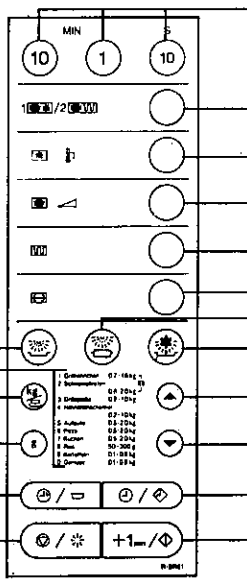
Auto-Touch Control Panel

Digital display
Indicators

1. Microwave and defrost indicator
2. Convection indicator
3. Grill indicator
4. Rotisserie indicator
5. Easy reheat indicator
6. Auto cook indicator
7. Easy defrost indicator
8. Cook indicator



9. Weight indicator
10. Microwave power level indicator
11. Number indicator
12. Auto start indicator
13. More/Less indicator



EASY REHEAT key
AUTO COOK MENU GUIDE in German
You can select and stick the menu label written in your favorite language of Dutch, English, French, Italian and Spanish.
WEIGHT (NUMBER) ENTRY keys
MINUTE TIMER/HOLD key
STOP/CLEAR key

OPERATING SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st latch switch, 2nd latch switch, 3rd latch switch and stop switch).

IMPORTANT
When the oven door is closed, the monitor switch contacts COM-NC must be open.
When the microwave oven is pluged in a wall outlet (220 -- 230V 50Hz) the line voltage is supplied to the point A5+A3 in the control unit.

Figure O-1 on page 38

1. **The display flashes "88:88".**
2. **To set any programmes or set the clock, you must first touch the (⊘/✲) key.**
3. **[1:00] appears in the display and the time counts up every minute.**

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the touching (10) (1) (10) key and start the oven with touching [+1min/⏲] key.

Function sequence Figure O-2 on page 38

CONNECTED COMPONENTS	RELAY
Oven lamp and turntable motor	RY1
Power transformer	RY2
Fan motor	RY7

1. The line voltage is supplied to the primary winding of the power transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltagedoubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channeled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays ; RY1+RY2+RY7 go back to their home position. The circuits to the oven lamp, power transformer, fan motor and turntable motor are cut off.
5. When the door is opened during a cook cycle, the switches come to the following condition.

SWITCH	CONTACT	CONDITION DURING COOKING	CONDITION DOOR OPEN (NO COOKING)
1st Latch Switch	COM-NO	Closed	Open
2nd Latch Switch	COM-NO	Closed	Open
Monitor Switch	COM-NC	Open	Closed
3rd Latch Switch	COM-NO	Closed	Open
Stop Switch	COM-NO	Closed	Open

The circuits to the power transformer, fan motor and turntable motor are cut off when the 1st latch switch, 2nd latch switch, 3rd latch switch and stop switch are made open.
The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relays RY1 stay closed. Shown in the display is the remaining time.

6. MONITOR SWITCH CIRCUIT
The monitor switch SW4 is mechanically controlled by oven door, and monitors the operation of the 1st latch switch SW1.

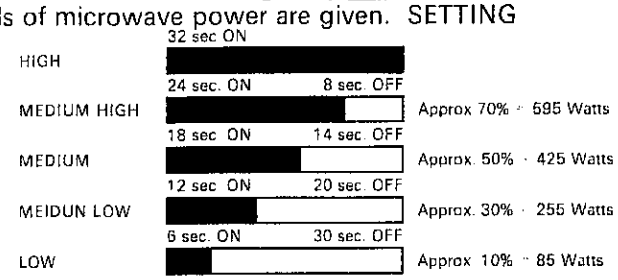
6-1 When the oven door is opened during or after the cycle of a cooking program, the 1st latch, 2nd latch and stop switches SW1+SW2+SW5 must open their contacts first. After that the contacts (COM-NC) of the monitor switch SW4 can be closed and then contacts of the 3rd latch switch SW3 can be opened.

6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch SW4 must be opened first, and the contacts (COM-NO) of the 3rd latch switch SW3 must be closed. After that the contacts of the stop switch SW5, 1st latch and 2nd latch switchesSW1+SW2 are closed.

6-3. When the oven door is opened and the contacts of the 1st latch switch SW1 remain closed, the fuseF1 F6.3A will blow, because the monitor switch is closed and a short circuit is caused through the 1st latch switch SW1, the monitor switch SW4, the monitor resistor R1 and the fuse F1 F6.3A.

VARIABLE COOKING

When the microwave oven is preset for variable cooking power, the line voltage power is supplied to the power transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given. SETTING



NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

CONVECTION COOKING CONDITION

PREHEATING CONDITION (Figure O-3)

Program desired convection temperature by touching the (CONVECTION MODE) key.
When the START key is touched, the following operations occur:

1. The coil of shut-off relays RY1, RY6 and RY7 are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.
2. The coil of relay RY5 is energized by the control unit. The damper is moved to the closed position, opening the damper switch contacts.
   The opening of the damper switch contacts sends a signal to the LSI on the control unit de-energizing the relay RY5 and opening the circuit the damper motor.
3. The coil of shut-off relayRY3 is energized by the control unit and the mains supply voltage is added to the convection heating element.
4. When the oven temperature reaches the selected preheat temperature, the following operations occur:
   4-1. The shut-off relay RY3 is de-energized by the control unit temperature circuit and thermistor, opening the circuit to the convection heating element.
   4-2. The oven will continue to function for 15 minutes, turning the convection heating element on and off, as needed to maintain the selected preheat temperature.
   The oven will shut-down completely after 15 minutes.

CONVECTION COOKING CONDITION (Figure O-3)

When the preheat temperature is reached, a beep signal will sound indicating that the holding temperature has been reached in the oven cavity. Open the door and place the food to be cooked in the oven. Program desired cooking time and convection temperature by touching the (CONVECTION MODE) key. When the START key is touched, the following operation occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, turntable motor, cooling fan motor and convection motor are energized.
3. Relay RY3 is energized (if the cavity temperature is lower than the selected temperature) and the mains supply voltage is applied to the convection heating element to return to the selected cooking temperature.
4. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and convection motor, are de-energized. At the end of the convection cycle, if the thermistor temperature is above 118°C, the circuit to RY-7 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor unit the temperature drops below 100°C, at which time the relay will be de-energized, turning off the fan motor. RelayRY-6 will however, opens as soon as the convection cycle has ended, turning off the convection motor.
5. At the end of the convection cook cycle, shut-off relay RY-5 is energized turning on the damper motor. The damper is returned to the open position, closing the damper switch contacts which send a signal to the control unit, de-energizing shut-off relay RY-5.

GRILL COOKING CONDITION (Figure O-4)

In this condition the food is cooked by grill heating element energy. And at the initial period (approximately 10 minutes) the convection heating element is also activated.
Program desired cooking time and grill mode by touching (10) (1) (10) (TIME) keys and (GRILL MODE) key.
When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The damper motor is turned on to close the damper.
3. The relays RY1+RY6+RY7 are energized.
4. The oven lamp, turntable motor, cooling fan motor, and convection motor are energized.
5. The relay RY4 is energized. The two (2) grill heating elements are energized. At the same time, if the oven cavity temperature is lower than 215°C the relays RY3 and RY6 are energized. And the convection motor CM and the convection heating element CH are energized once.
6. When the thermistor temperature reaches more than 215°C, the relay RY3 and RY6 are energized. And the convection motor CM and the convection heating element CH are de-energized. After that, they are not be energized again.
7. Now, the food is grilled by the grill heating element (and convection heating element).
8. If the temperature of thermistor becomes more than 250°C, the grill heating element is stopped to be heated. The temperature becomes less than 250°C, the grill heating element is heated again. After cooking, if the thermistor temperature is more than 100°C the circuit to RY7 will be maintained (by

thermistor circuit) to continue operation of the cooling fan motor until temperature drops below 100°C. If the oven is operated for more than 3 minutes, the fan motors operate for 1 minute even if the thermistor temperature is less than 100°C.

DUAL COOKING CONDITION

DUAL1 COOKING (Figure O-5)
(Microwave and Convection)

Program desired cooking time and DUAL 1 mode by touching the TIME keys and 1(微波) 2(微波+對流) (DUAL COOK SELECTION) key.

When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The damper motor is turned on to close the damper.
3. The oven lamp, turntable motor, cooling fan motor, and convection motor are energized.
4. Relay RY3 is energized (if the cavity temperature is lower than the selected temperature) and the mains supply voltage is supplied to the convection heating element.
5. The relay RY2 is energized and the microwave energy is generated by the magnetron.
6. Now, the food is cooked by the microwave and convection heating element energy simultaneously.

DUAL2 COOKING (Figure O-6)
(Microwave and Grill)

Program desired cooking time and DUAL 2 mode by touching the TIME keys and DUAL COOK SELECTION 1(微波)/2(微波+燒烤)key twice

When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The damper motor is turned on to close the damper.
3. The oven lamp, turntable motor and fan motor are energized.
4. Relay RY4 is energized and the mains supply voltage is supplied to the grill heating element.
5. The relay RY2 is energized and the microwave energy is generated by the magnetron.
6. Now, the food is cooked by the microwave and grill heating element energy simultaneously. After cooking, if the thermistor temperature is more than 100°C the circuit to RY7 will be maintained (by thermistor circuit) to continue operation of the cooling fan motor until temperature drops below 100°C. If the oven is operated for more than 3 minutes, the fan motors operate for 1 minute even if the thermistor temperature is less than 100°C.

ROTISSERIE COOKING (Figure O-7)

When the ROTISSERIE COOKING key is touched before touching the START key, the following operations also occur:

1. Relay RY8 is energized and mains suplly voltage is supllied to the rotisserie motor.
2. The turntable motor also rotates in Rotisserie Cooking condition.

The Figure O-7 is the Oven Schematic in case that Dual2 cooking mode is programmed and Rotisserie cooking mode is programmed.

AUTO COOK PROGRAM

Repeat touching the AUTO COOK key until the desired cooking program appears in the display. Then using the WEGHT ENTRY key, enter the weight (see the chart in the cookbook) and touch the START key. And the oven start the cooking time, grill mode, dual mode, convection mode, microwave mode and rotisserie cooking mode are automatically computed and selected based on the programs.

EASY DEFROST COOKING

The EASY DEFROST functions as automatic defrosting. What should be done is enter the weight of food with the weight entry touch WEIGHT key. Once the oven starts, it will cook according to the special cooking sequency.

EASY REHEAT COOKING

Repeat touching the EASY REHEAT key until the desired cooking program appears in the display. Then using the WEGHT ENTRY key, enter the weight or number of food and touch the START key. And the oven start, the cooking time is computed and cooking mode is selected based on the programes automatically.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the open lever pushes lower latch lever. The 3rd latch lever pushes lower latch head on the door upward. The 1st latch head is linked with the 3rd latch lead, so now, the door can be opened.

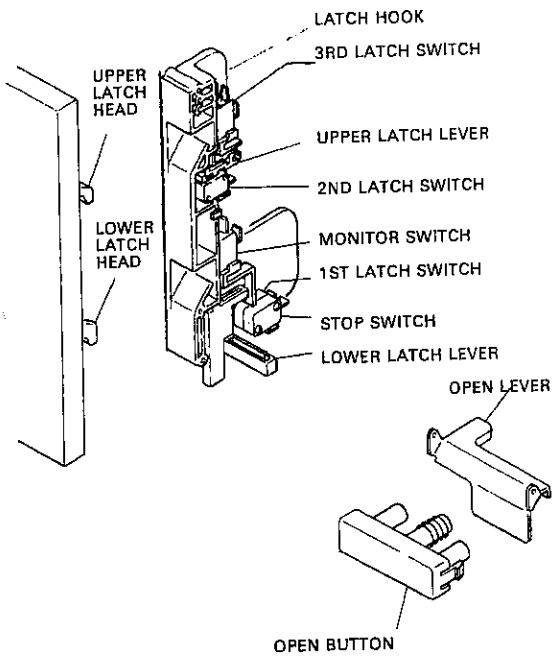


Figure D-1. Door Open Mechanism

2ND LATCH SWITCH SW2 AND 3RD LATCH SWITCH SW3

1. When the oven door is closed, the contacts COM-NO must be closed.
2. When the oven door is opened, the contacts COM-NO must be opened.

1ST LATCH SWITCH SW1

1. When the oven door is closed, the contacts COM-NO must be closed.
2. When the oven door is opened, the contacts COM-NO must be opened.

STOP SWITCHE SW5

1. This switch must make a contact when the door is closed, and open it when the door is opened.

MONITOR SWITCH SW4

The monitor switch is activated (the contacts opened) by the lower latch head on the door while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse(F6.3A) F1 when the contacts of the 1st latch switch SW1 fail to open when the door is opened.

Function

1. When the door is opened, the monitor switch SW3 contacts close (to the ON condition) due to their being normally closed. At this time the 1st latch switch SW1 is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts are first opened and 3rd latch switch contacts are closed and then the 1st latch switch, latch switch and stop switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened and the 1st latch switch contacts fail to open, the fuse F1 (F6.3A) blows simultaneously with closing of the monitor switch contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F1 F6.3A TEST THE 1ST LATCH SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

MONITOR RESISTOR

The monitor resistor prevents the fuse F1 F6.3A bursting when the fuse F1 F6.3A 250V blows due to the operation of the monitor switch.

NOISE FILTER

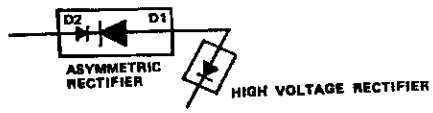
The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

WEAK POINT WP A017

If the wire harness or electrical components are shortcircuited, this weak point WP A017 blows to prevent an electric shock or fire hazzard.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow is both directions. And it prevents the temperature rise of the power transformer by blowing the fuse F2 F8A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of the blowing the fuse F2 F8A.)

1. The high voltage rectifier is shorted by any causes when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the power transformer.
5. The large electric currents beyond F8A flow through the primary widing of the power transformer.
6. The fuse F2 F8A blows by the large electric currents.
7. The power supplying to the power transformer is cut off.

FUSE F2 F8A

1. If the wire harness or electrical components are short-circuited, this fuse F2 F8A blows to prevent an electric shock or fire hazzard.
2. The fuse F2 also blows when the asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of power transformer is shorted.

FUSE F1 F6.3A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazzard.
2. The fuse also blows when 1st latch switch SW1 remains closed with the oven door open and when the monitor switch ; SW4 closes.

This thermal cut-out protect the fan motor against overheat. If its temperature goes up higher than 104°C because the fan motor is locked or the ventilation openings are blocked, the contacts of the thermal cut-out TC1 will open and the line voltage to the control unit will be cut off and the operation of the oven will be stoped.
The defective thermal cut-out TC1 must be replaced with new one.

TEMPERATURE FUSE 150°C TC2 (CONV.)
This temperature fuse protect the convection motor against overheat. If its temperature of the convection motor rises above 145°C because the convection fan is interrupted, the ventilation openings are obstruccted or the other abnormal matter occures, the temperature fuse ; TC2 opens and switch off the oven. The defective temperature fuse TC2 must be replaced with new one.

TEMPERATURE FUSE 150°C TC3
This temperature fuse protect the oven against overheat during grill cooking, convection cooking or dual (combination) cooking. If the temperature rise above 150°C because the fan motor is interrupte the air inlet duct is blockeed or the ventilation openings are obstructed, the temperature fuse TC3 opens and switches off the grill heating element and covection heating element. The defective thermal cut-out TC1 must be replaced with new one.

THERMAL CUT-OUT 145°C TC4 (MG)
This thermal cut-out protects the magnetron against overheat. If this temperature goes up higher than 145°C because the fan motor is interrupted, the ventilation openings are blocked, the thermal cut-out TC1 will open and the line voltages to the power transformer T will be cut off and the operation of the magnetron MG will be stoped.
The defective thermal cut-out TC1 must be replaced with new one.

THERMISTOR
The thermistor is a negative temperature coefficient type. The temperature in the oven cavity is detected through the resistance of the thermistor, and then the control unit causes the heater relay to operate, thus the current to the heating element is turned ON/OFF.

SURGE RELAY RY9 AND SURGE RESISTOR R2 10Ω/20W
When the START (+/⏲) key is touched the contacts of the surge relay RY9 close and the surge current flows through the surge resistor R2 for 200 msec. After about 20 msec. since the contacts of the surge relay close, the relay RY2 closes and supplies the power transformer with the line voltage. After 200 msec, the surge relay RY9 opens its contacts and gets out of function. The surge resistor R2 lets the current (peak current) flow when the oven is switched on. If surge resistor is defective, the home fuse or the Weak point WP or F2 F8A may break down when the oven is switched on (Micowave mode/ Dual mode).
CAUTION; THE SURGE RELAY RY9 CLOSES FOR ONLY 200 msec. JUST WHEN THE OVEN GETS RESTARTED, BUT OPENS AGAIN. WITHIN THIS 200 MSEC., THE RELAY RY-2 MUST CLOSE.

TURNTABLE MOTOR
The turntable motor drives the roller stay to rotate the turntable.

CONVECTION MOTOR
The convection motor drives the convection fan and provids the heated air.

FAN MOTOR
The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through the exhausing air vents at the oven cavity.

GRILL HEATING ELEMENT
The grill heating element is provided to brown the food and is located on the top of the oven cavity.

CONVECTION HEATING ELEMENT
The convection heating element is located at the rear of the oven cavity. It is intended to heat air driven by the convection fan. The heated air is kept in the oven and force-circulated and reheated by the convection heating element.

CONVECTION COOKING SYSTEM
This oven is designed with a hot air heating system where food is not directly heated up by the convection heating element, but food is heated by forced circulation of the hot air produced by the convection heating element.
The air heated by the convection heating element is circulated through the convection passage provided on the outer casing of the oven cavity by the convection fan which is driven by the convection motor. It then enters the inside of the oven through the vent holes provided on the back side of the oven. Next,the hot air heats the food on the turntable and leaves the oven cavity through the vent in the oven cavity rear wall.

Without leaving the oven, this hot air is reheated by the convection heating element, passes through the convection passage and enters the inside of the oven cavity again, in a continuing cycle.
In this way, the hot air circulates inside the oven cavity to raise its temperature and, at the same time, comes into contact with the food being cooked.
When the temperature inside the oven cavity reaches the selected temperature, the convection heating element is de-energized. When the temperature inside the oven cavity drops below the selected temperature, the convection heating element is energized again. In this way, the inside of the oven cavity is maintained at approximately the selected temperature.
When the convection time reaches "0", the convection heating element is deenergized and the convection fan stops operating and the oven shuts off.
After the oven shuts off, if the temperature inside of oven cavity is more than 100°C, the fan motor remains rotating until the temperatur goes down less than 100°C.

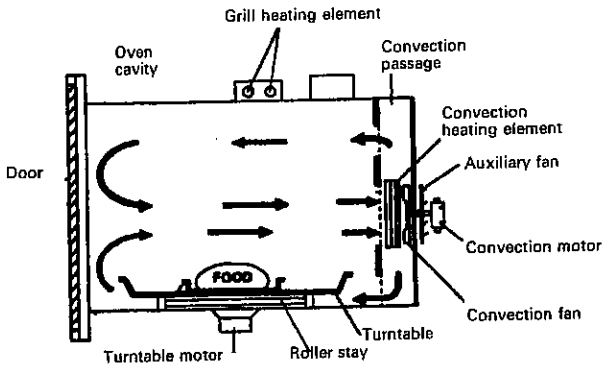


Figure D-2 Convection Cooking System

DAMPER OPEN-CLOSE MECHANISM

Usually, the damper is in the open position except during convection cooking, grill cooking, dual cooking. Damper position is set automatically by damper motor, damper switch, motor cam and damper shaft.
These components are operated by a signal that judges if microwave cooking, convection cooking, grill cooking or dual cooking operation is selected by the control unit.
Microwave Cooking:
Damper is in the open position, because a portion of cooling air is channeled through the cavity to remove steam and vapors given off from the heating foods.
It is then exhausted at the top of the oven cavity into a condensation compartment.

Convection Cooking:
Damper is in the closed position, so that no hot air will be allowed to leak out the oven cavity.

Damper Operation

1. When power supply cord is plugged in:
   1-1. When power supply cord is plugged in and any cooking programs are started, a signal is sensed in the control unit, and operates shut-off relay (RY5).
   1-2. Contacts of shut-off relay (RY5) close, the damper motor is energized, opening the damper door.
   1-3. When the damper is moved to the open position by the damper cam, damper switch is closed (ON position).
   1-4. The signal of damper switch is re-sensed in the control unit and shut-off relay (RY5) is turned off.
   1-5. The line voltage to the damper motor is stopped and the motor turns off.

2. When oven is microwave cooking:
   Damper is in the open position.

3. When oven is convection cooking:
   3-1. Damper motor is energized by touching the CONVECTION key and START key.
   3-2. When damper is in the closed position (damper switch is OFF), its signal is sensed by the control unit, and shut-off relay (RY5) is de-energized.
   3-3. The damper is held in the closed position during the convection cooking operation.
   3-4. At the end of the convection cooking, shut-off relay (RY5) is energized, and the damper is returned to the open position.

NOTE: If the damper is not in the proper position, closed during convection, grill and dual cooking or opened during microwave, the control unit will stop oven operation after 1 minute.

ROTISSERIE COOKING SYSTEM

All the surfaces of the food will be able to be cooked without turning over by rotating the food which the skewer is inserted into.

OPERATION OF FAN MOTOR (FM) CONTROLLED BY THERMISTOR AND CONTROL UNIT

1. After convection, grill or dual cooking, if the temperature of the thermistor is more than 100°C, the circuit to relay RY7
   will be maintained (by the thermistor circuit) to continue operation of the fan motor FM until the temperature drops below 100°C, at which time the relay RY7 will be de-eneregizes, turning off the fan motor FM
1. The fan motor FM rotate for 1 minute after the oven is operated for more that 3 minutes in convection, grill or dual cooking mode.

OPEN JUDGE BY THERMISTOR

1. If the temerature of the thermistor does not rise to more than 40°C after 3 minutes from when the oven is started in convection, grill or dual cooking mode, the oven is turned off.
2. When the thermistor or the wire harness to the thermistor is opened, the oven is turned off because this condition is same as above 1.

ROTTISSERIE MOTOR

The rotisserie motor is located on the on the right side wall of the oven cavity
The skewer is rotated by the rotisserie motor assembly.

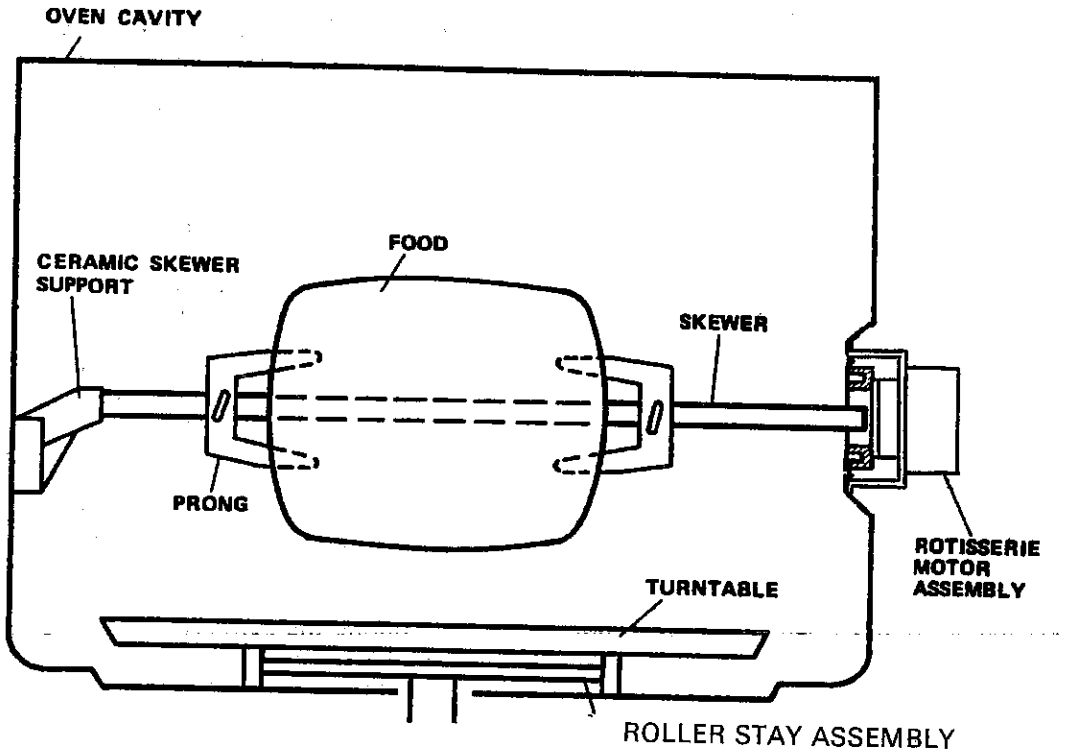


Figure D-3. Rottisserie Mechanism

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts:
High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

1) Disconnect the supply.
2) Door opened, and wedged open.
3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

1) Reconnect all leads removed from components during testing.
2) Replace the outer case (cabinet).
3) Reconnect the supply.
4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the microwave timer for two (2) minutes. Set the power level to HIGH and push the START button. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test carried out.

(RD81001H)

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpfull to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure"section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F1 (F6.3A) in the 1std latch switch - monitor switch - monitor resisitor circuit, check the 1std latch switch, monitor switch and monitor resistor before replacing the fuse F1 (F6.3A).

NOTE: "○" means direct cause and part. "△" means indirect cause and part.

CONDITION	PROBLEM \ POSSIBLE CAUSE AND DEFECTIVE PARTS / TEST PROCEDURE	A MAGNETRON	B POWER TRANSFORMER	C H.V. RECTIFIER	C ASYMMETRIC RECTIFIER	C H.V. HARNESS	C HIGH VOLTAGE RECTIFIER ASSEMBLY	D CAPACITOR	E 1ST LATCH SWITCH	E 2ND LATCH SWITCH	E STOP SWITCH	E DAMPER SWITCH	E MONITOR SWITCH	E 3RD LATCH SWITCH	F THERMAL CUT-OUT 104°C TC1	F Temp. Fuse150°C TC2	F Temp. Fuse 150°C TC3
	When the door is opened, Fuse F1 F6.3A blows								○								
OFF CONDITION	Home fuse blows when power supply cord is plugged into wall outlet.																
	WEAK POINT WP blows when power supply cord is plugged into wall outlet.																
	FUSE F1 F6.3A blows when power supply cord is plugged into wall outlet.												○				
	"88:88" does not appear in display but power supply cord is plugged into wall outlet.																
	Display does not operate properly when STOP/CLEAR key is touched.										○						
	Oven lamp does not light at door opened.										○						
ON COMDITION (COMMON)	Oven does not start when the START key is touched. (Display appears)										○						
	Oven lamp does not light (Fan motor operate)																
	Fan motor does not operate (Oven lamp light)																
	Damper motor does not operate. (Oven lamp light)																○
	Convection motor does not operate. (Oven lamp light)											○					
	Turntable motor assembly does not operate.(Oven lamp light)									○				○			
	Oven or electrical parts does not stop but cooking time is 0 or STOP/CLEAR key touched.									○				○			
	Oven stops after about 3 minutes since START key is touched. (Except for Microwave mode and Dual 2 mode)																
	Rotisserie motor does not operate. (Oven lamp lights.)													○			
	Home fuse blows when the START key is touched.																
	Oven stops after about 1 minute since STRAT key is touched.											○					
	Oven goes into cook cycle but shuts down before end of cooking cycle.														○	○	
	After cooking, the temperature of thermistor is higher than 100°C but the fan motor does not operate.																
MICROWAVE COOKING CONDITION	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at HIGH)	○	○	○	○	○	○		○								
	Oven does not seem to be operating properly when MEDIUM HIGH, MEDIUM, MEDIUMLOW or LOW is set. (Oven operates properly at HIGH)																
	Oven goes into cook cycle but shuts down before end of cycle.														○	○	
CONVECTION COOKING CONDITION	Convection heating element does not operate.																○
	Oven seem to be operating but temperature in the oven cavity is lower or higher than preset one.																
GRIL COOKING CONDITION	Grill heating element does not operate.																○
	Though the temperature of the oven cavity is higher than 215°C convection heating element does not stop to heat. Or though the temperature of thermistor is lower than 215°C convection heating element does not stop to heat.																
DUAL1, 2 COOKING CONDITION	Oven goes into cook cycle but shuts down before end of cycle.														○	○	○
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power does not seem to be generated properly.)	○	○	○	○	○	○										
DUAL1 COOKING CONDITION	Oven seems to be operating but the temperature of the oven cavity is lower or higher than preset one.																
	Convection heating element does note operate.																○
DUAL2 COOKING CONDITION	Grill heating element does not operate.																○

| | | |

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	MAGNETRON TEST

~~NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED~~ TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECKS

Isolate the magnetron from the high voltage circuit by removing all leads connected to the filament terminal.

To test for an open circuite filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for a short circuit filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an inifinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER BY WAY OF IEC 705

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer casefitted).
Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used.
When P(W) heating works for t(second), approximately P x t/4.187 calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is V x ΔT.

The formular is as follows;

$$P \times t / 4.187 = V \times \Delta T$$
$$P\ (W) = 4.187 \times V \times \Delta T / t$$

Our condition for the water load is as follows:
Room temperature ... around 20°C, Power supply Voltage ... 220 – 230 volts.
Water load ... 1000 ml, Initial temperature ... 10±2°C, Heating time .... 49sec.
$P = 85 \times \Delta T$

Measuring condition:

1. Container
   The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
   The oven and the empty vessel are at ambient temperature prior to the start of the fest.
3. Temperature of the water
   The initial temperature of the water is (10 ± 2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and an accurate thermometer.
7. The water load must be (1000 ± 5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.

   Example: The initial temperature T1 = 11°C

2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

4. Operate the microwave oven at HIGH for the temperature of the water rises by a value △ T of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.
6. Measure the final water temperature.

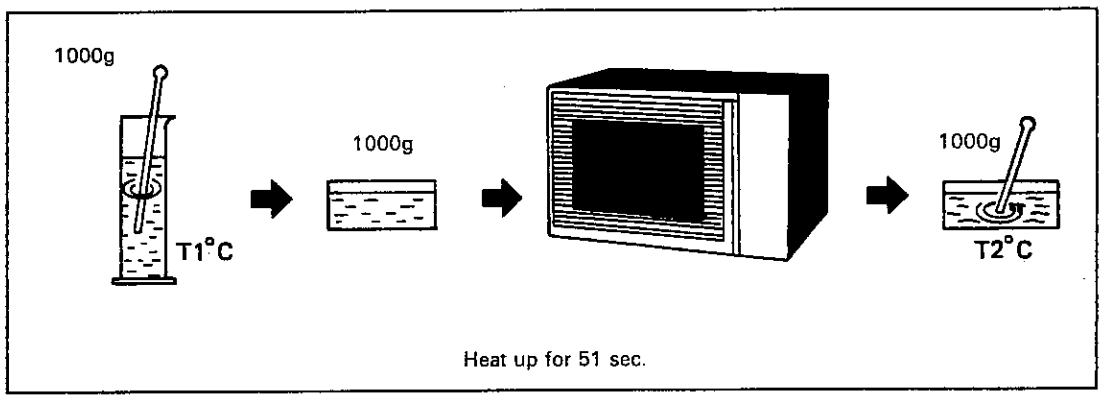
Example: The final temperature T2 = 21°C

7. Caluculate the microwave power output P in watts from above formula.

Initial temperature	T1 = 11°C
Temperature after (49 + 2) = 51 sec.	T2 = 21°C
Temperature difference Cold-Warm	△T = 10°C
Mean temperature rise △T	
Measured output power The equation is as follows: P= 85 x △T	P= 85 x 10°C = 850 Watts

JUDGMENT: The measured output power should be at least ±15 % of the rated output power.

CAUTION: 1°C CORRESPONDS TO 85 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B **POWER TRANSFORMER TEST**

WARNING: High voltages and large currents are present at the secondary winding and filament winding of the power transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements at the high-vltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the power transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained :

a. Primary winding ----------0.94 ohms approximately.
b. Secondary winding -------61.6 ohms approximately.
c. Filament winding ---------less than 1 ohm.

If the reading obtained are not as stated above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

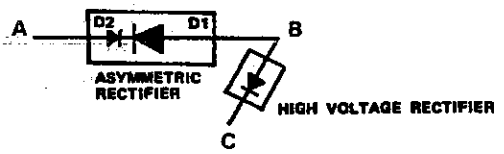
C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is intinte in one direction and mor than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS



ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both directions then the asymmetric rectifier is good. If a asymmetric rectifier is shorted in either direction, then the the asymmetric rectifier is probably faultly and must be replaced with the high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power transformer is shorted.

CARRY OUT 4R CHECKS

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIRE, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLYAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

A. Isolate the high voltage capacitor from the circuit.
B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10 KΩ after it has ben charged.
D. A short-circuited capacitor shows continuity all the time.
E. An open capacitor constanlly shows a resistance about 10 MΩ because of its internal 10 MΩ resistance.
F. Whe the internal wire is opened in the high voltage capacitor, the capacitor shows an infinite resistance
G. The resistance across all the terminals and the chassis must be inifinte when the capacitor is normal.

If incorrect readings are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS

E SWITCH TEST

CARRY OUT 3D CHECKS.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal
NO; Normally open terminal
NC; Normally closed terminal .br
S.C.; Short circuit,
O.C.; Open circuit

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F TEMPERATURE FUSE OR THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the temp. fuse or thermal cut-out. Then using an ohmmeter, make a continuity test across the each two terminals as described in the table below.

CARRY OUT 4R CHECKS

Table: Temperature Fuse or Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit). (°C)	Indication of ohmmeter (When room temperature is approx. 20°C.)
Thermal cut-out 104°C TC1 (FAN)	Below -20°C	Above 115°C	Closed circuit.
Temperature fuse 150°C TC2 (CONV)	This is not resetable type.	Above 150°C	Closed circuit.
Temperature fuse 150°C TC3 (OVEN)	This is not resetable type.	Above 150°C	Closed circuit.
Thermal cut-out 145°C TC4 (MAG)	Below -20°C	Above 145°C	Closed circuit

If incorrect readings are obtained, replace the temp. fuse or thermal cut-out.

An open circuit thermal cut-out (TC1) indicates that the fan motor has overheated, this may be due to resisted ventilation or locked cooling fan.

An open circuit temperature fuse (TC2) indicates that the convection fan motor winding has overheated, this may be due to resisted ventilation or locked cooling fan.

An open circuit temperature fuse (TC3) indicates that the oven has overheated, this may be due to resistricted ventilation or locked cooling fan.

An open circuit thermal cut-out (TC4) indicates that the magnetron has heated, this may be due to resisted ventilation, cooling fan failure or a fault condition within the magnetron H.V. circuit.

G MOTOR WINDING TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the motor.
Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 186 ohms
Turntable motor	Approximately 11.9 kohms
Convection fan motor	Approximately 164 ohms
Rotisserie motor	Approximately 15.9 kohms
Damper motor	Approximately 12.1 kohms

If incorrect readings are obtained, replace the motor.
(Also refer to test procedure H)

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

H LIVE TEST FOR MOTOR WINDINGS

CAUTION: The following procedure requires the oven to be connected to the supply and should only be used if the relevant "cold" checks for the motor under test are inconclusive.

1. CARRY OUT 3D CHECKS
2. Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis. (Use insulation tape if necessary.)
3. Connect a voltmeter, set to 250V AC, across the motor terminals. (Refer to the relevant motor test procedure or pictorial diagram for the correct terminal numbers.)
4. Arrange the meter in a position where it can be read during the test. (Do not touch the meter, meter leads or oven circuitry while the oven is active.)
5. Close the oven door.
6. Set the relevant timer for about three (3) minutes, set the power level to HIGH and push the START button.
7. Note the reading on the meter and carefully observe the motor under test to see if it is turning.
8. CARRY OUT 3D CHECKS
9. Remove test meter leads.
10. Reconnect the leads to the primary of the power transformer.

If a reading of line voltage was obtained (step 7) but the motor was not turning then it is faulty and should be replaced. If the meter indicated that no supply was present then the wiring to the motor should be checked for continuity.

I MONITOR RESISTOR AND SURGE RESISTOR TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the monitor resistor or surge resistor.
Using an ohmmeter and set on a low range.
Check between the terminals of the monitor resistor or surge resistor as described in the following table.

Table: Resistance

Resistor	Resistance
Monitor resistor	Approx. 3.6Ω
Surge resistor	Approx. 10Ω

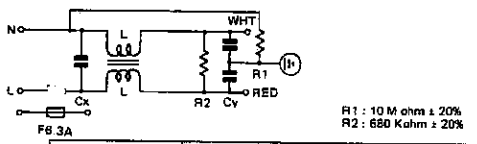
If incorrect readings are obtained, replace the monitor resistor or surge resistor

CARRY OUT 4R CHECKS.

J NOISE FILTER TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the noise filter. Using an ohmmeter, check between the terminals as described in the following table.



L (min)	Cx ± 20%	Cy ± 20%
1.0 mH	0.22μF	4700pF

MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approximately 680kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are obtained, replace the noise filter unit. CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
K	**BLOWN FUSE F1 F6.3A**

CARRY OUT 3D CHECKS;.ssp If the ovens internal fuse F1 F6.3A is blown when the door is opened, check the 1st latch switch, monitor switch and monitor resistor.

If the fuse F1 F6.3A is blown by incorrect door switching replace the defective switch(s) and the fuse F1
F6.3A.;.ssp CARRY OUT 4R CHECKS

CAUTION: Only replace fuse with the correct value replacement.

L	**BLOWN WEAK POINT WP A017**

CARRY OUT 3D CHECKS;.ssp If the weak point WP A017 is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

CAUTION: Only replace weak point with the correct value replacement.

M	**BLOWN FUSE F2 F8A**

CARRY OUT 3D CHECKS;.ssp If the fuse F2 F8A is blown, there is a short in the asymmetric rectier or there is a ground in wire harness. A short in the asymmetric rectifier may be occured due to short or or ground in H.V. rectifier, magnetron, power transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

CAUTION: Only replace weak point with the correct value replacement.

N	**CONVECTION HEATING ELEMENT AND GRILL HEATING ELEMENT TEST**

CARRY OUT 3D CHECKS;.ssp Before carring out the following tests make sure the heating element is fully cool.

1. Resistance of heating element
   Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the folowing table.

Table: Resistance of heater

Parts name	Resistance
Convection heating element	Approximately 35 Ω
Grill heating elements	Approximately 51 Ω (Resistance of each element is approx. 25.5 Ω)

2. Insulation resistance
   Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element and cavity using a 500V - 100MΩ insulation tester. The insulation resisitance should be more than 10MΩ in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

O THERMISTOR TEST

CARRY OUT 3D CHECKS. ssp Disconnect connector-E from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's E-3 and E-4.

Room Temp.	Resistance
68 F(20 C) - 86 F(30 C)	Approx. 326kΩ - 175kΩ

If the meter does not indicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS

P RELAY TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis.(Use insulation tape if necessary.)
Reconnect the supply.
Check voltage between Pin Nos. 3 and 5 of the 3-pin connector (A) on the control unit with an A.C. voltmeter. The meter should indicate 220-230 volts, if not check oven circuit.

Shut-off, Cook and Heater Relay Test
These relays are operated by D.C. voltage.
Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking or convection cooking operation.

DC. voltage indicated .....Defective relay.
DC. voltage not indicated .....Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 13 V.D.C.	Oven lamp and Turntable motor
RY2	Approx. 13 V.D.C.	Power transformer
RY3	Approx. 13 V.D.C.	Convection heater
RY4	Approx. 13 V.D.C.	Grill heater
RY5	Approx. 14 V.D.C.	Damper motor
RY6	Approx. 14 V.D.C.	Convection motor
RY7	Approx. 13 V.D.C.	Cooling fan motor
RY8	Approx. 14 V.D.C.	Rotisserie motor
RY9	Approx. 13 V.D.C.	Surge resistor

CARRY OUT 4R CHECKS

Q TOUCH CONTROL PANEL ASSEMBLY TEST

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit , troubleshooting by unit replacement is described according to the symptoms indicated.

1. Key Unit.

The following symptoms indicate a defective key unit. Replace the key unit.

a) When touching the pads, a certain pad produces no signal at all.
b) When touching a number pad, two figures or more are displayed.
c) When touching the pads, sometimes a pad produces no signal.

2. Control Unit

The following symptoms indicate a defective control unit. Replace the control unit.

2-1 Programming problems.

a) When touching the pads, a certain group of pads do not produce a signal.

2-2 Display problems.

a) For a certain digit, all or some segments do not light up.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
	b) For a certain digit, brightness is low. c) Only one indicator does not light up. d) The corresponding segments of all digits do not light up; or they continue to light up. e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits ficker. 2-3 Other possible problems caused by defective control unit. a) Buzzer does not sound or continues to sound. b) Clock does not operate properly. c) Cooking is not possible. d) Proper temperature measurement is not obtained.

R PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN.

To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

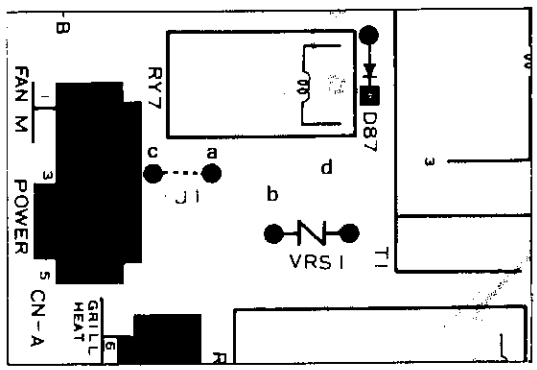
Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS

Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis.(Use insulation tape if necessary.)
Reconnect the supply.

STEPS	OCCURANCE	CAUSE OR CORRECTION
1	The rated voltage is not applied to POWER terminal of CPU connector (CN-A)	Check supply voltage and oven power cord.
2	The rated voltage is applied to primary side of T/C transformer.	T/C transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire 1 and solder (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RFILNA003DRE0 between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)

NOTE:* At the time of these repairs, make a visual inspection of the varistor for burn damage and test the T/C transformer with an ohmmeter for the presence of layer short-circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

(1) Key Unit
(2) Control Unit

The principal functions of these units and the signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through P01,P04,P07,P11 and P26.
When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R0-R3 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, temperature measurement circuit and indicator circuit.
(*RD915B1U)

1) LSI
This LSI controls the temperature measurement signal, key strobe signal, relay driving signal for oven function and indicator signal.
(*RD916A1U)

2) Power Source Circuit
This circuit generates voltages (VA: -15V, VC: -5V, VF1: -25V, VF2: -28V and Vp: -34V) necessary in the control unit.

3) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit.
It accompanies a very small error because it works on commercial frequency.
(RD918A2U)

4) ACL Circuit
A circuit to generate signals resetting the LSI to the initial state when power is supplied.
(RD919A3U)

5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit noticing sounds (key touch sound and completion sound).

6) Temperature Measurement Circuit(1): Oven
The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The result of detecting is given to LSI controlling the relay and display.
(RD91FA3U)

7) Door Sensing Switch
A switch to "tell" the LSI if the door is open or closed.

8) Relay Circuit
To drive the magnetron, convection heater, grill heater, fan motor, convection motor, damper motor, turntable motor, rotisserie motor, surge relay and light the oven lamp.

9) Indicator Circuit
Indicator element is a Fluorescent Display.
Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode.
The Fluorescent Display has 6-digits, 17-segments.
(RD91DA2U)

DESCRIPTION OF LSI

LSI(IZA335DR)

The I/O signals of the LSI(IZA335DR) are detailed in the following table.

PIN NO. 1	SIGNAL VREF	I/O IN

Reference voltage input terminal.
A reference voltage applied to the A/D converter in the LSI.
Connectd to GND.(0V)

(RD93GA6U)

PIN NO. 2	SIGNAL IN7	I/O IN

Terminal not used. Connected to GND.

PIN NO. 3	SIGNAL IN6	I/O IN

Heating constant compensation terminal.

(RD93GA7U)

PIN NO. 4	SIGNAL IN5	I/O IN

Terminal to change functions according to the model.
Signal in accordance with the model in operation is applied to set up its function.

(RD93JA1U)

PIN NO. 5	SIGNAL IN4	I/O IN

Input signal which communicates the damper open/close information to LSI.
Damper opened; "H" level signal(0V:GND).
Damper closed; "L" level signal(-5V:VC).

(RD937A3U)

PIN NO. 6	SIGNAL IN3	I/O IN

Input signal which communicates the door open/close information to LSI.
Door closed; "H" level signal(0V).
Door opened; "L" level signal(-5V).

(RD937A2U)

PIN NO. 7	SIGNAL IN2	I/O IN

Temperature measurement input: OVEN THERMISTOR.
By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.

(RD935A1U)

PIN NO. 8-9	SIGNAL IN1-IN0	I/O IN

Terminal not used.

PIN NO. 10-14	SIGNAL P47-P43	I/O OUT

Terminal not used.

PIN NO. 15	SIGNAL P42	I/O OUT

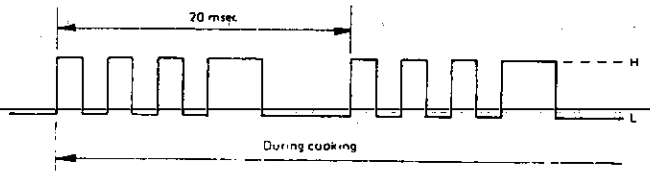
Timing signal output terminal for temperature measurement(OVEN).
"H" level (GND) : Temperature measuring timing. (convection and grillcooking).
"L" level (-5V) : Thermistor OPEN timing.

(RD935A6U)

PIN NO 16	SIGNAL P41	I/O OUT

Oven lamp and Turntable motor driving signal.

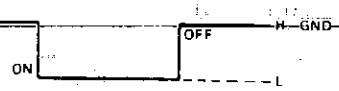
The square waveform voltage is delivered to the RY1 driving circuit and relays (RY2,3,4.6.9) control circuit.



PIN NO. 17	SIGNAL P40	I/O OUT

Damper motor relay drivng signal.

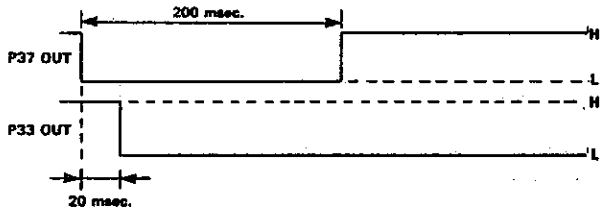
To turn on and off shut-off relay(RY5).



PIN NO. 18	SIGNAL P37	I/O OUT

Surge limiting relay driving signal.

The surge limiting relay is designed to turn on 20 msec.earlier than the cook relay (RY2).

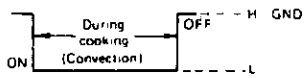


(RD932A12)

PIN NO. 19	SIGNAL P36	I/O OUT

Convection motor driving signal.

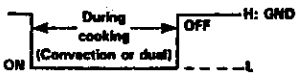
To turn on and off shut-off relay(RY6).
"L"level during convection; "H"level otherwise.



PIN NO. 20	SIGNAL P35	I/O OUT

Convection heater driving signal.

To turn on and off the convection heater relay(RY3).
"L"level during convection or dual cooking; "H"level otherwise.
During convection cooking, the signal becomes "H"level when the temperature of the oven cavity exceeds the predetermined temperature.



(RD932A16)

PIN NO. 21	SIGNAL P34	I/O OUT

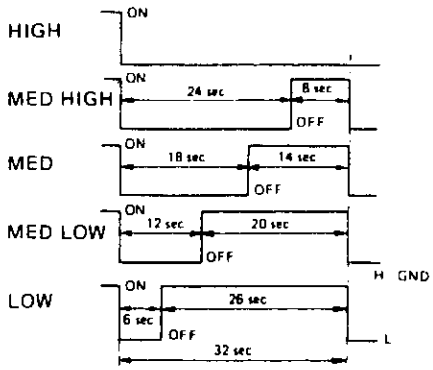
Cooling fan motor driving signal.

To turn on and off the shut-off relay(RY7).
"L"level during cooking:"H" level otherwise.

PIN NO. 22	SIGNAL P33	I/O OUT

Magnetron high-voltage circuit driving signal.

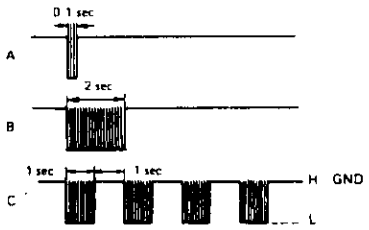
To turn on and off the cook relay(RY2).
In high operation, the signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (MED HIGH, MED, MED LOW, LOW) the signal turns to "H" level and "L" level in repetition according to the power level.



PIN NO. 23	SIGNAL P32	I/O OUT

Signal to sound buzzer.

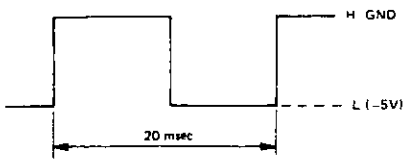
A: Key touch sound.
B: Completion sound.
C: When the temperature of the oven cavity reaches the preset temperature in the preheating mode, or when the preheating hold time (15 minutes) is elapsed.



PIN NO. 24	SIGNAL P31	I/O IN

Signal synchronized with commercial power source frequency.

This is the basic timing for all time processing of LSI.



PIN NO. 25	SIGNAL P30	I/O OUT

Rotisserie motor driving signal.

To turn on and off shut-off relay(RY8).
"L"level during cooking; "H"level otherwise.

PIN NO. 26	SIGNAL CNVSS	I/O IN

Connected to VC

PIN NO. 27	SIGNAL RESET	I/O IN

Auto clear terminal.

Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is reset. Thereafter set at "H" level.

(RD93MA5U)

PIN NO. 28	SIGNAL XIN	I/O IN

Internal clock oscillation frequency setting input.

The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.

PIN NO. 29	SIGNAL XOUT	I/O OUT

Internal clock oscillation frequency control output.

Output to control oscillation input of XIN.

PIN NO. 30	SIGNAL XCIN	I/O IN

Terminal not used

PIN NO. 31	SIGNAL XCOUT	I/O OUT

Terminal not used.

PIN NO. 32	SIGNAL VSS	I/O IN

Power source voltage: -5V.
VC voltage of power source circuit input.

PIN NO. 33	SIGNAL Ø	I/O OUT

Terminal not used.

PIN NO. 34	SIGNAL R3	I/O IN

Signal coming from touch key.
When either one of G-1 line keys on key matrix is touched, a corresponding signal out of P01,P04,P07,P11 and P26 will be input into R3. When no key is touched, the signal is held at "L" level.

(RD93CA11)

PIN NO. 35	SIGNAL R2	I/O IN

Signal similar to R3.
When either one of G-2 line keys on key matrix is touched, a corresponding signal will be input into R2.

(RD93CA10)

PIN NO. 36	SIGNAL R1	I/O IN

Signal similar to R3.
When either one of G-3 line keys on key matrix is touched, a corresponding signal will be input into R1.

(RD93CA10)

PIN NO. 37	SIGNAL R0	I/O IN

Signal similar to R3.
When either one of G-4 line keys on key matrix is touched, a corresponding signal will be input into R0.

(RD93CA10)

PIN NO. 38	SIGNAL VP	I/O IN

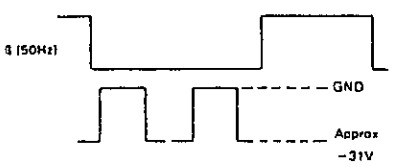
Anode (segment) of Fluorescent Display light-up voltage: -34V.
Vp voltage of power source circuit input.

(RD93GA8U)

PIN NO. 39-40	SIGNAL P17-P16	I/O OUT

Segment data signals.
The relation between signals and indicators are follows:

Signal	Segment	Signal	Segment
P17	m	P04	h, l
P16	LB1	P02	g
P14	LB2	P01	f
P13	UB1	P00	e
P11	UB2	P26	d
P10	k	P25	c
P07	j	P23	b
P05	i	P21	a

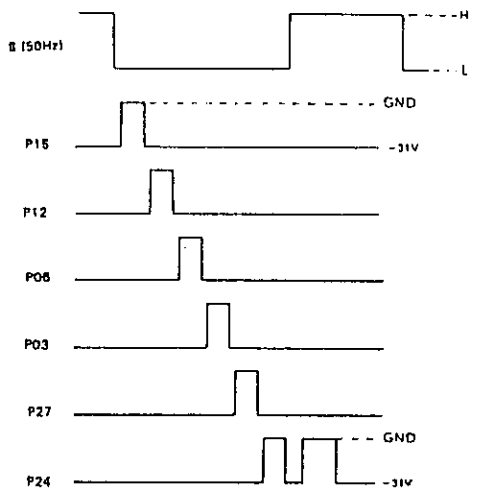


PIN NO. 41	SIGNAL P15	I/O OUT

Digit selection signal.
The relation between digit signal and digit are as follows:

Digit Signal	Digit
P15	1st
P12	2nd
P06	3rd
P03	4th
P27	5th
P24	6th

Normally, one pulse is output in every ß period, and input to the grid of the Fluorescent Display.



PIN NO. 42-43	SIGNAL P14-P13	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 44	SIGNAL P12	I/O OUT

Digit selection signal.
Signal similar to P15.

(RD938A2U)

PIN NO. 45	SIGNAL P11	I/O OUT

Segment data signal.
Signal similar to P17.
Key strobe signal.
Signal applied to touch-key section.
A pulse signal is input to R0-R3 terminal while one of G-5 line keys on key matrix is touched.

PIN NO. 46	SIGNAL P10	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 47	SIGNAL P07	I/O OUT

Segment data signal.
Signal similar to P17.
Key strobe signal.
Signal applied to touch-key section.
A pulse signal is input to R0-R3 terminal while one of G-7 line keys on key matrix is touched.

PIN NO. 48	SIGNAL P06	I/O OUT

Digit selection signal.
Signal similar to P15.

(RD938A2U)

PIN NO. 49	SIGNAL P05	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 50	SIGNAL P04	I/O OUT

Segment data signal.
Signal similar to P17.
Key strobe signal.
Signal applied to touch-key section.
A pulse signal is input to R0-R3 terminal while one of G-9 line keys on key matrix is touched.

PIN NO. 51	SIGNAL P03	I/O OUT

Digit selection signal.
Signal similar to P15.

(RD938A2U)

PIN NO. 52	SIGNAL P02	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 53	SIGNAL P01	I/O OUT

Segment data signal.
Signal similar to P17.
Key strobe signal.
Signal applied to touch-key section.
A pulse signal is input to R0-R3 terminal while one of G-8 line keys on key matrix is touched.

PIN NO. 54	SIGNAL P00	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 55	SIGNAL P27	I/O OUT

Digit selection signal.
Signal similar to P15.

(RD938A2U)

PIN NO. 56	SIGNAL P26	I/O OUT

Segment data signal.
Signal similar to P17.
Key strobe signal.
Signal applied to touch-key section.
A pulse signal is input to R0-R3 terminal while one of G-6 line keys on key matrix is touched.

PIN NO. 57	SIGNAL P25	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 58	SIGNAL P24	I/O OUT

Digit selection signal.
Signal similar to P15.

(RD938A2U)

PIN NO. 59	SIGNAL P23	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 60	SIGNAL P22	I/O OUT

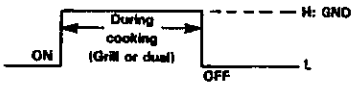
Terminal not used.

PIN NO. 61	SIGNAL P21	I/O OUT

Segment data signal.
Signal similar to P17.

PIN NO. 62	SIGNAL P20	I/O OUT

Grill heater driving signal.
To turn on and off the grill heater relay(RY4). "H"level during grill or dual cooking; "L" level otherwise.



(RD932A19)

PIN NO. 63/64	SIGNAL AVCC/VSS	I/O IN/IN

Connected to GND.

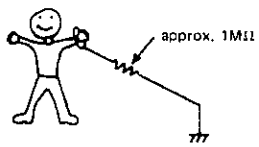
SERVICING

1. Precautions for Handling Electronic Components.

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed.

CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charged in clothes, etc,and sometimes it is not fully protected by the built-in protection circuit.

1) When storing and transporting, thoroughly wrap them in aluminum foil.
   Also wrap PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components

Transistor
2SB793

Transistor
DTD143EA

Transistor
2SA933S
DTA143ES
DTA114YS
DTC114ES
DTB143ES

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing the touch control panel of the microwave oven and the caution you must consider when doing so.

To carry the servicing, power supply to the touch control panel is available either from the power line of the oven proper itself of from an external power source.

(1) Servicing the touch control panel with power supply from the oven proper:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL A LIVE TO GIVE YOU DANGER DURING SERVICING.

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven proper to keep you from touching the high voltage transformer, or unplug the primary terminal (connector) of the high power transformer to turn it off; and the end of such connector shall be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven proper is so short that they can't be separated from each other.
   For those models, therefore, check and repair all the controls (with the sensor-related ones included) of the touch control panel while keeping it in contact with the oven proper.
B. On some models, on the other hand, the power supply cord between the touch control panel and the oven proper is so long that they may be separated from each other. For those models, therefore, it is allowed to check and repair the controls of the touch control panel while keeping it apart from the oven proper;in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to that with the oven door being closed.
   As to the sensor-related controls of the touch control panel, their checking is allowed if the dummy resistor(s) whose resistance is equal to that of those controls is used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven power, and short both ends of the door sensing switch (on PWB) of the touch control panel,which brings about such an operational state that is equivalent to that with the oven door being closed. And connect an external power source to the power input terminal of the touch control panel, and then it is allowed to check and repair the controls of the touch control panel; as in the case of (1) B above, it is here also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required when servicing the touch control panel assembly.

1) Soldering iron: 30W
(To prevent leaking current, it is recommended to use a soldering iron with grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) When turning on the power source of the control unit, remove the aluminum foil applied for preventing static electricity.
2) Connect the connectors of the indicator and key unit to the control unit taking care that the lead wires are not twisted.
3) After aluminum foil is removed, take extra care that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, taking care that all connections are tight.
5) Be sure to use specified components where high precision is required.

(RD94ZE4U)

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch heads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 1 inch (3cm) to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.
6. Discharge the HV capacitor before carring out any further work.
7. Do not operate the oven with the outer case removed.

N.B.; Step 1,2 and 6 form the basis of the 3D checks.

CAUTION:	DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

POSITIVE LOCK CONNECTOR REMOVAL

Pushing the lever of positive lock connector. Pull out the positive lock connector.

CAUTION: When you (Service engineers) connect the positive lock connectors to the terminals, connect the positive lock so that the lever face you(Service engineer).

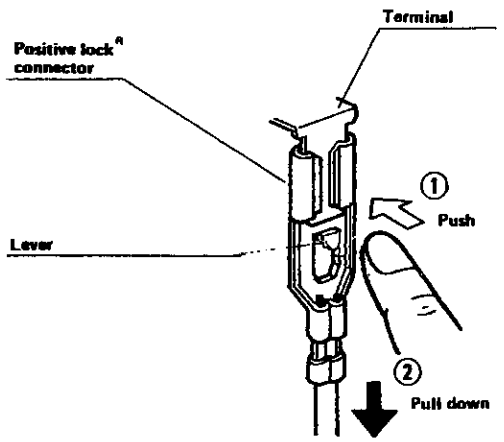


Figure C-1. Positive lock connector

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS
2. Remove one (1) screw holding capacitor holder to bottom plate.
3. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder.

4. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.
5. Disconnect the high voltage wire of high voltage rectifier assembly from the power transformer.
6. Now high voltage rectifier assembly and capacitor should be free.

CAUTION:	WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH A EARTHING SCREW.

POWER TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the wire leads from power transformer
3. Disconnect the leads from magnetron filament.
4. Disconnect the leads of the power transformer from high voltage capacitor and magnetron.
5. Pull the lead of the power tranformer out of the ferrite core and the hole of the thermal protection plate rear.
6. Remove the two (2) screws holding the transformer to unit chassis.
7. Remove the transformer.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove two (2) screws holding the chassis support to the rear cabinet and the partition plate T. And remove the chassis support.
3. Disconnect leads from magnetron. Remove one (1) screw holding the magnetron duct to magnetron. And remove the magnetron duct.
3. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws holding the magnetron to prevent it from falling.
4. Remove the magnetron from the waveguide with care so the magnetron antenna should not hit by any metal object around the antenna.

CAUTION:	WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

CONTROL PANEL REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the all connectors of main harness and low voltage wire harness.
3. Remove the four (4) screws holding the control panel plate to the oven cavity, the partition plate T and bottom plate, and remove the control panel.
4. Lift up the control panel assembly and pull it forward. Now, the control panel assembly is free.

CONTROL UNIT AND KEY UNIT REMOVAL

1. Remove the control panel from the oven cavity, refering to "CONTROL PANEL REMOVAL".
2. Remove the single (1) screw holding the panel frame to the back plat.
3. Separate the panel frame and back plate by sliding.
4. Remove the three (3) screws holding the control unit to the panel frame.
5. Disconnect the key connector from the control unit.
6. Lift up the control unit.
7. Now, the control unit and frame assembly are separated.

FAN MOTOR

1. Remove the power transformer from the bottom plate refering to "POWER TRANSFORMER REMOVAL".
2. Disconnect the wire leads from the fan motor and thermal cut-out.
3. Remove the two (2) screws holding the fan motor angle to the fan duct.
4. Remove the fan motor angle from fan duct.
5. Remove the fan blade from the fan motor.
6. Remove the two(2) screws holding the fan motor to fan motor angle.
7. Remove the single (1) screw and single (1) nut holding thermal cut-out angle.
8. Now, the fan motor is free.

CONVECTION HEATING ELEMENT OR CONVECTION FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the seven(7) screws holding the rear cabinet to the convection fan duct, bottom plate and chassis support.
3. Remove the rear cabinet from the oven.
4. Disconnect the wire leads from the convection heating element, convection motor, thermal cut-out and thermistor.
5. Remove the single (1) screw holding the steam duct to oven cavity, and remove the steam duct.
6. Remove the ten (10) screws holding the convection fan duct to the oven cavity and bottom plate.

7) Remove the convection fan duct from the oven.

CONVECTION HEATING ELEMENT

8. Remove the two(2) screws holding the two convection heating element insulater (A) to the convection fan duct and remove the insulator (A).
9. Remove the two(2) screws holding the convection heating element to the convection insulator (B).
10. Now, the convection heating element is free.

CONVECTION FAN MOTOR

8. Remove the one(1) nut holding the convection fan, washers, pipe and auxiliary fan to the convection fan motor shaft.
9. Remove the two(2) screws and washers holding the convection motor mounting plate to the thermalcover (Rear).
10. Remove the pin on the convection fan motor shaft.
11. Remove the two(2) screws holding the convection motor mounting plate to the convection fan motor.
12. Remove the single (1) screws and sungle nut holding the fan thermo angle to the fan motor.
13. Remove the convection cushion from the fan motor.
14. Now, the convection fan motor is free.

TURNTABLE MOTOR REMOVAL

1. Disconnect the oven from power supply.
2. Remove single (1) screw holding the turntable motor cover to the bottom plate, and remove the cover.
3. Disconnect wire leads from the turntable motor.
4. Remove the two (2) screws holding the turntable motor to oven cavity through thebthermal protector plate bottom.
5. Remove the turntable motor
6. The turntable motor is now free.

Note When the coupling or O-ring is replaced to new one, the grease (Shinetsu Silicone grease G420 of Shinetsu Chemical Co. Ltd.) must be applied as shown illustration
If the grease is not applied, the coupling and O-ring may be damaged.

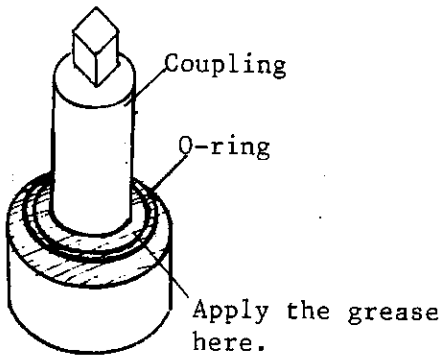


Figure C-2. Grease apllying position

ROTISSERIE MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire harness (main) from the rotisserie motor.
3. Remove the two (2) screws holding the rotisserie motor angle to the oven cavity.
4. Remove the rotisserie motor angle with the rotisserie motor from the oven cavity.
5. Remove the two (2) screws holding the rotisserie motor to rotisserie motor angle.
6. Now, the rotisserie motor assembly is free.

GRILL HEATING ELEMENTS REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove the seven (7) screws holding the rear cabinet to cinvection fan duct, bottom plate and chassis support.
3. Remove the rear cabinet from the oven cavity.
4. Remove the single (1) screw holding the steam duct to the oven cavity.
5. Remove the steam duct from the oven cavity.
6. Make the four (4) tabs straight which are holding the thermal-cover grill to the oven cavity.
7. Disconnect the leads from the grill heating elements.
8. Remove the single (1) screw holding the grill heater cover to the oven cavity.
9. Remove the grill heater cover from the oven cavity by sliding the cover.
10. Remove the grill heating elements with a short-plate from the oven cavity.
11. Remove the two (2) screws holding the short-plate to the two (2) grill heating elements.
12. Now, the grill heating elements are free.

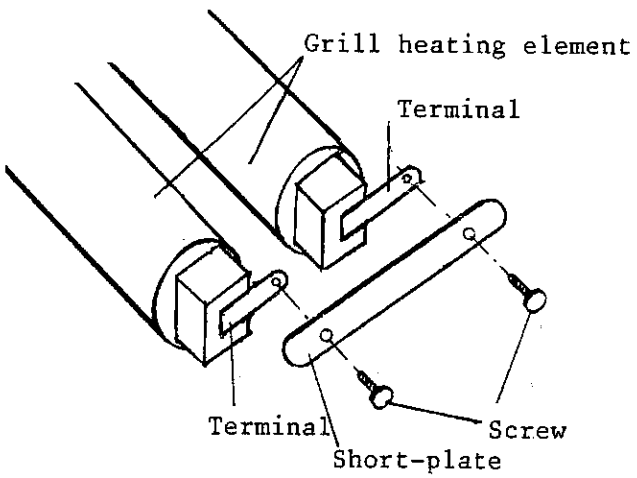


Figure C-3. Short-plate installation

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
3. Lift up the oven lamp socket.
4. Now, the oven lamp socket is free.

CAUTION: When replacing the oven lamp socket, replace it so that the side where the black dot is put faces upward.

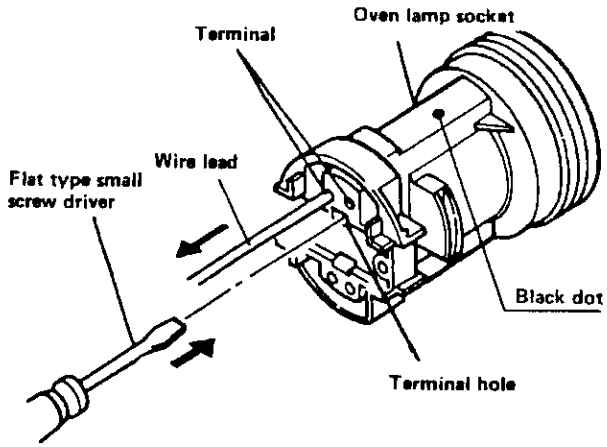


Figure C-4. Oven lamp socket

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the green/yellow wire to the rear cabinet.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-1. Positive Lock Connector.
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

Re-install

1. Insert the moulding card stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-5. Installation of Power supply cord.
2. Install the earth wire lead of power supply cord to the rear cabinet with screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

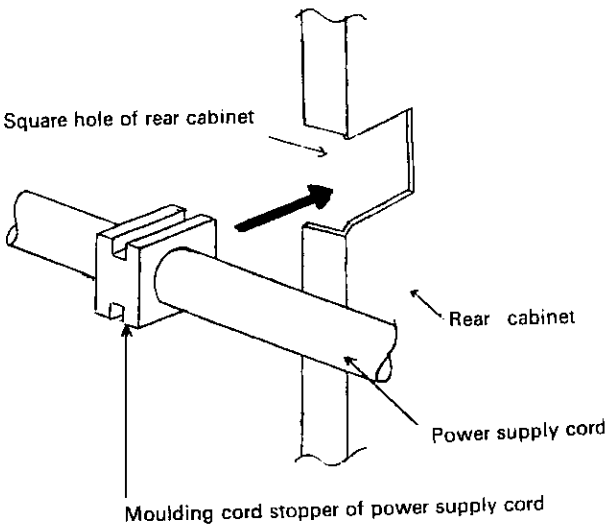


Figure C-5. Replacement of Power Supply Cord

DAMPER MOTOR AND DAMPER SWITCH REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the leads from damper motor and damper switch.
3. Remove the single (1) screw holding the damper motor mounting plate to the partition plate T.
4. Remove the damper cam from the damper motor.
5. Remove the single (1) screws holding the damper motor to the damper motor mounting plate. Now, the damper motor is free.
6. Remove the single (1) screw holding the damper switch to the damper motor mounting plate. Now, the damper switch is free.

1ST LATCH, 2ND LATCH, 3RD LATCH, STOP AND MONITOR SWITCHES REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the all switches on latch hook.
3. Remove the two (2) screws holding the latch hook to the oven cavity flange, and remove the latch hook.
   (For removing 2nd latch switch, 3rd latch switch or monitor switch)

4. Push the retaining tab slightly and remove the switch from the latch hook.
   (For removing the 1st latch switch and stop switche)
5. Remove the two (2) screws and nuts holding the switches to latch hook. Now, they are free.

Re-install
1. Re-install the 2nd latch switch, 3rd latch switch and monitor switch in place, referring to Figure C-5
2. Re-install the 1st latch switch and stop switch in place with the two (2) screws and nuts, referring to Figure C-5
3. Re-install the latch hook to the oven cavity flange with the two (2) screws.
4. Re-connect the wire leads to each switch, referring to chapter "Pictorial Diagram" correctly.
5. Make sure that each switch operates properly, referring to chapter "Test Procedure", and "Switches Adjustment".

1ST LATCH, 2ND LATCH, 3RD LATCH, STOP AND MONITOR SWITCHES ADJUSTMENT

If the 1st latch and stop switches, 2nd latch switch, 3rd latch switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.
1. CARRY OUT 3D CHECKS
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With door closed, adjust the latch hook by moving it back and forwod, or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the 3rd latch switch and monitor switch have activated with the door closed.
   The vertical position of the latch hook should be placed where the 1st latch and stop switches and 2nd latch switch have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure of the 1st latch switch, 2nd latch switch 3rd latch and stop switches and monitor switch operation. If those switches have not activated with the door closed, two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:
1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling the door toward the oven face. The results (plays of the door) should be less than 0.5mm.
2. The 1st latch switch and 2nd latch and stop switch interrupt the circuit before the door can be opened.
3. The monitor switch contacts close and the 3rd latch switch contacts open when the door is opened.
4. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

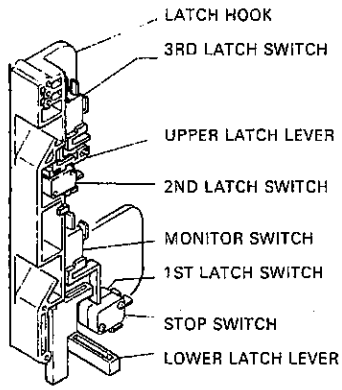


Figure C-6. Latch Switches Adjustment

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT
1. CARRY OUT 3D CHECKS
2. Remove five (5) screws holding the upper and lower oven hinge to the oven cavity. The lower oven hinge is now free.
3. Remove door assembly with upper oven hinge by pulling it forward.
4. Separate the door assembly and upper oven hinge. Door assembly is now free.
5. Re-install upper oven hinge to the new door assembly.
6. On re-installing new door assembly, secure the upper and lower oven hinges with the five (5) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.
7. CARRY OUT 4R CHECKS

Note: After any service to the door, and approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT
When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.
1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.

4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

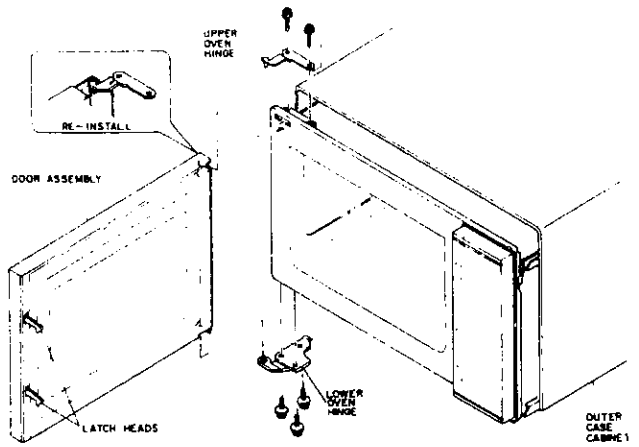


Figure C-7. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate(thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engagind part.
2. Lift up the choke cover, now cover is free.

DOOR PARTS REMOVAL

Remove the door assembly, referring to from item 1 through item 4 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.
2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".
3. Remove the three (3) screws holding the door sash right to the door panel assembly.

DOOR SASH REMOVAL

4. Pull the middle part of the door sash right and release the lower tab of the door sash right from the door frame.
5. Release the upper tab of the door sash right from the door frame. Now, the door sash right is free.

DOOR GLASS REMOVAL

6. Slide the door glass to the right side until stopped by door frame.
7. Slide the door glass up until stopped by the door frame.
8. Release the lower part of the door glass from the door frame at first, and then release the upper part of the door glass from the door frame. Now, the door glass is free.

DOOR FRAME REMOVAL

9. Remove the nine (9) screws holding the door frame to the door panel.
10. Release the door frame from the door panel, now the door frame is free.

LATCH HEAD REMOVAL

11. Release the latch spring from the tabs of the door panel.
12. Release the latch spring from the latch head.
13. Release the latch head from the door panel.
14. Naw, the latch head is free.

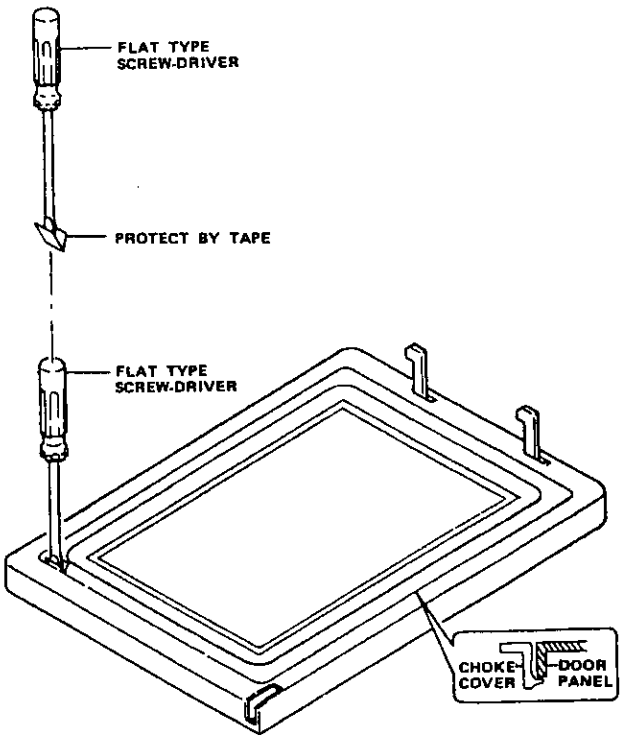


Figure C-8. Choke Cover Removal

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

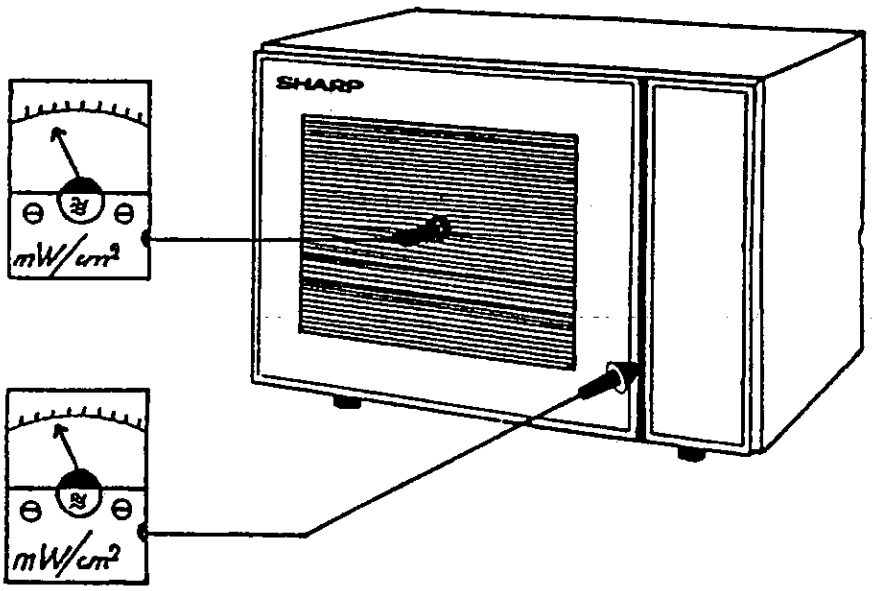
The safety switch must prevent microwave radiation emission in excess of 5mW/cm2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
   Important:
   Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.
   Recommended instruments are:
   NARDA 8100
   NARDA 8200
   HOLADAY HI 1500
   SIMPSON 380M
2. Place the oven tray into the oven cavity.
3. Place the load of 275±15ml of water initially at 20±5°C in the center of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster that 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.

(RDB1103U)



Microwave leakage measurement at 5 cm distance

TEST DATA TABLE

Parts	Symbol	Value / Data
Fuse	F1	F6.3A
Weak point A017	WP	Approx. 20A
Fuse	F2	F8A
Surge resistor	R2	10Ω 20W
Monitor resistor	R1	3.6Ω 20W
Thermal cut-out (Fan motor)	TC1	Off at 104°C
Temperature fuse(Convection)	TC2	Off at 150°C
Temperature fuse(Oven)	TC3	Off at 150°C
Grill heating elements	GH+GH	Approx. 51Ω (500W/112.5V x 2) Insulation resistance > 10MΩ
Convection heating element	CH	Approx. 35Ω Insulation resistance > 10MΩ
Oven lamp	OL	230V 25W E14
High voltagr capacitor	C	1.13μF AC 2100V
Thermistor		Approx. 326 kΩ -- 175 kΩ At 20°C -- 30°C
Magnetron	MG	Filament < 1Ω Filament — chassis ∞ ohm.
Power transformer	T	Filament winding < 1Ω Secondary winding Approx. 61.6Ω Primary winding Approx. 0.94Ω

TEST POINTS ON CONTROL UNIT (on "ON" CONDITION)

In/Out put terminal	Test point	Volt	Resistance (Disconnect the power plug)
Input terminal (power suplly)	A5— A3		Approx. 697Ω
Input terminal (stop switch)	E1 — E2		0
Input terminal (Themistor)	E3 — E4	DC. 5V	Approx. 91kΩ at 20°C -- 30°C
Input terminal (Damper switch)	E2 — E5		0
Output terminal (Grill heating element)	A5 — C6		51Ω
Output terminal (Convection heating element)	A5 — C1		33Ω
Output terminal (Oven lamp)	A5 — B3		179Ω
Output terminal (Fan motor)	A1 — A5		186Ω
Output terminal (Turntable motor)	A5 — B3		179Ω
Output terminal (Damper motor)	A5 — B5		12.1kΩ
Output terminal (Rotisserie motor)	A5 — B1		15.9kΩ
Output terminal (Convection fan motor)	A5 — B7		164Ω
Output terminal (Power transformer)	A5 — K1		0.94Ω
Output terminal (Earth)	E2 — Chassis		0

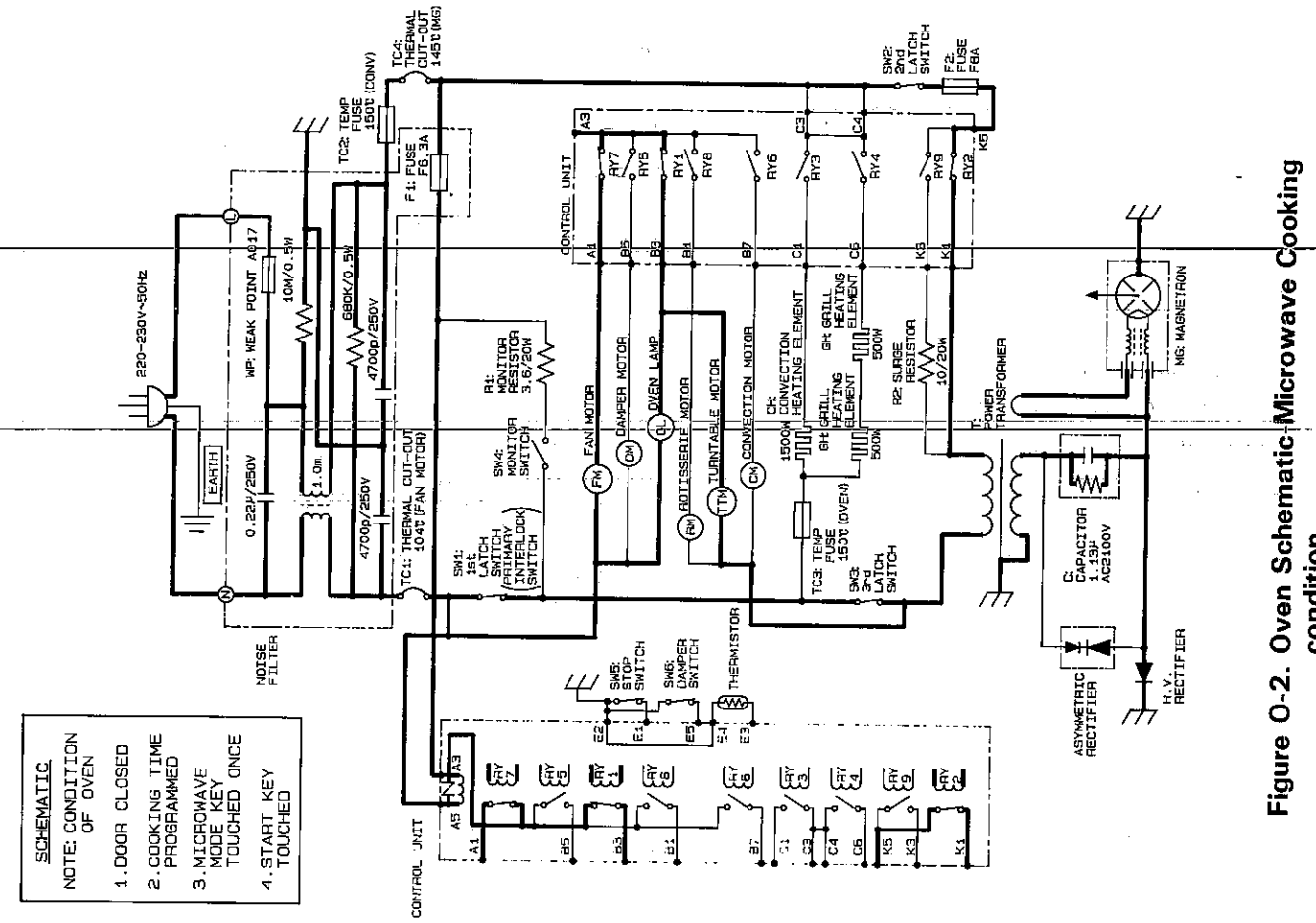


Figure O-2. Oven Schematic-Microwave Cooking condition

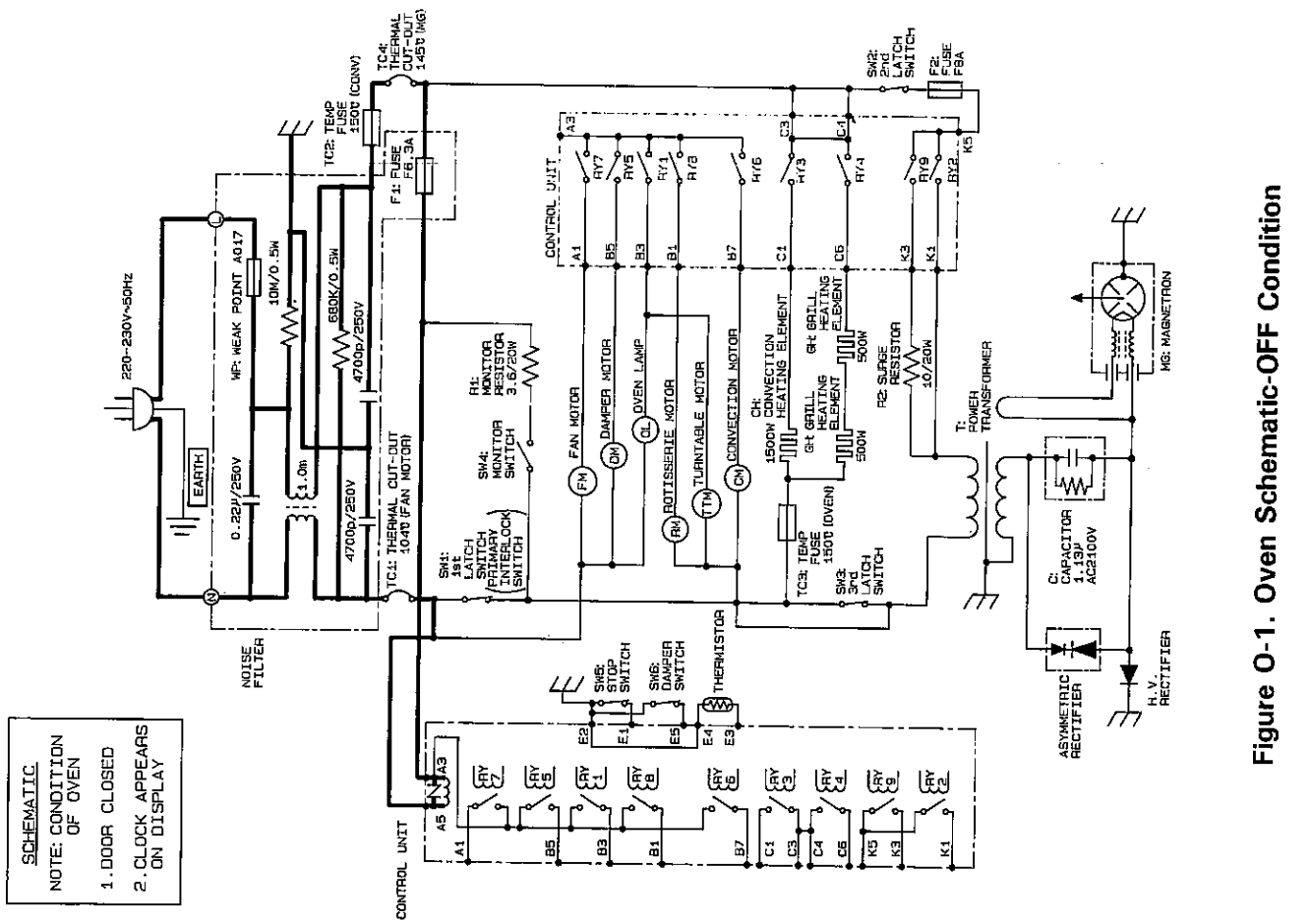


Figure O-1. Oven Schematic-OFF Condition

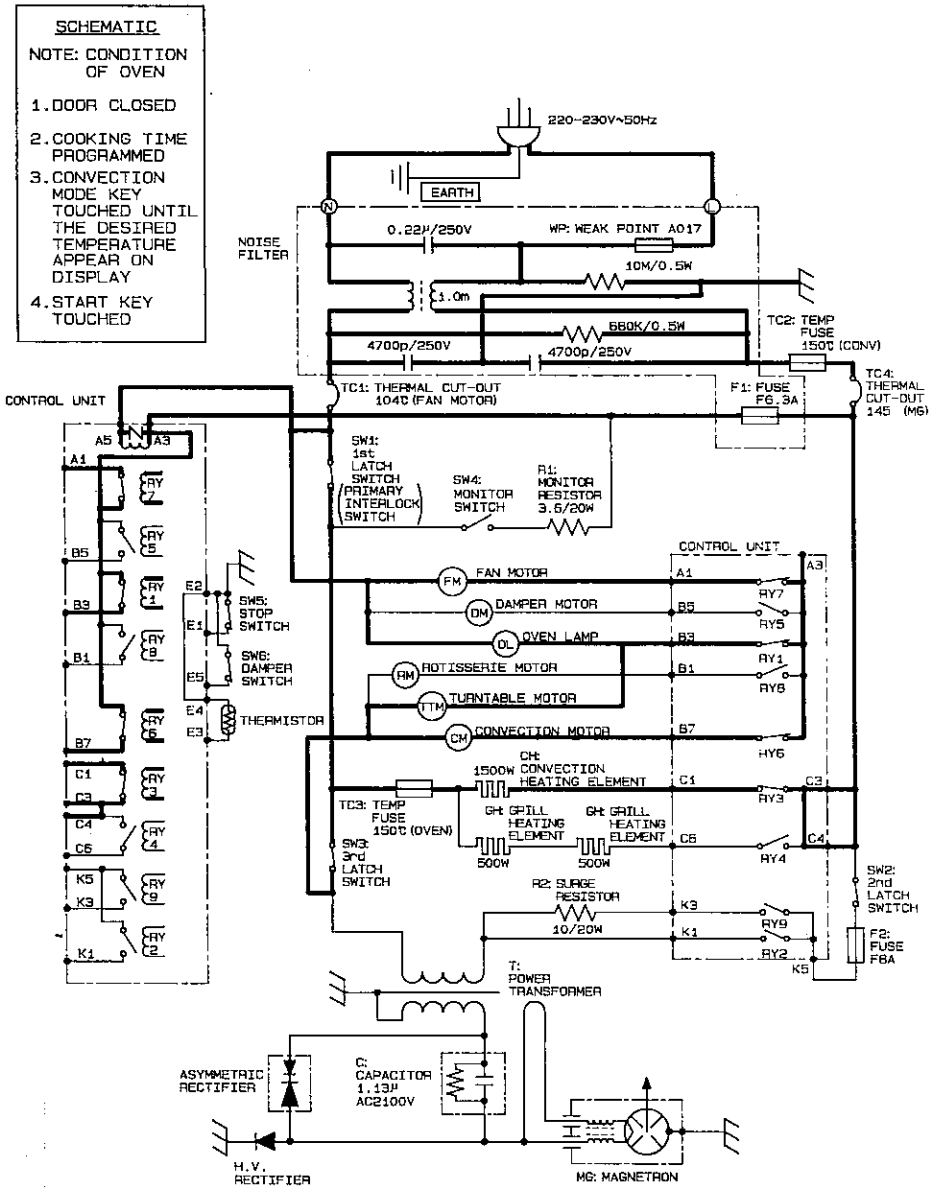


Figure O-3. Oven Schematic-Convection Cooking Condition

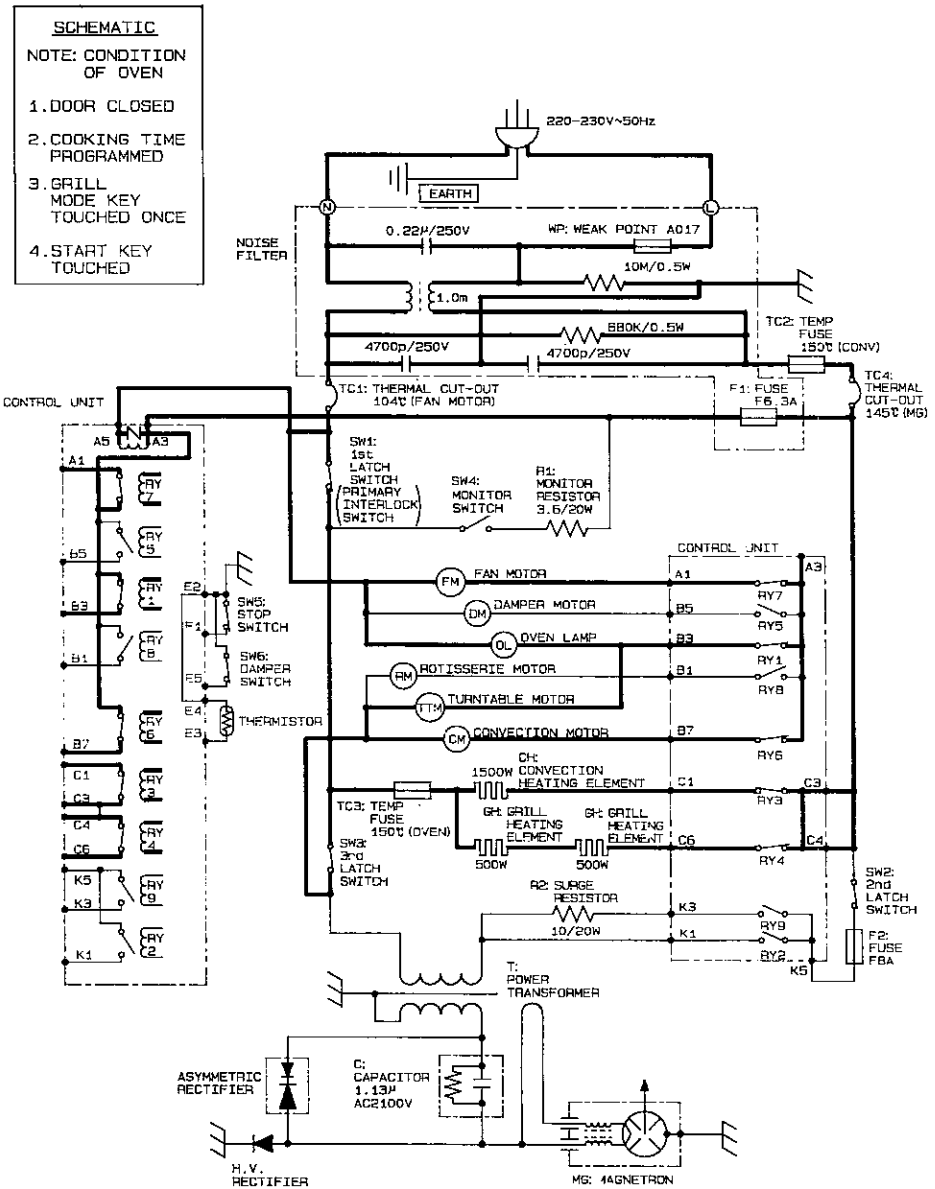


Figure O-4. Oven Schematic-Grill Cooking Condition

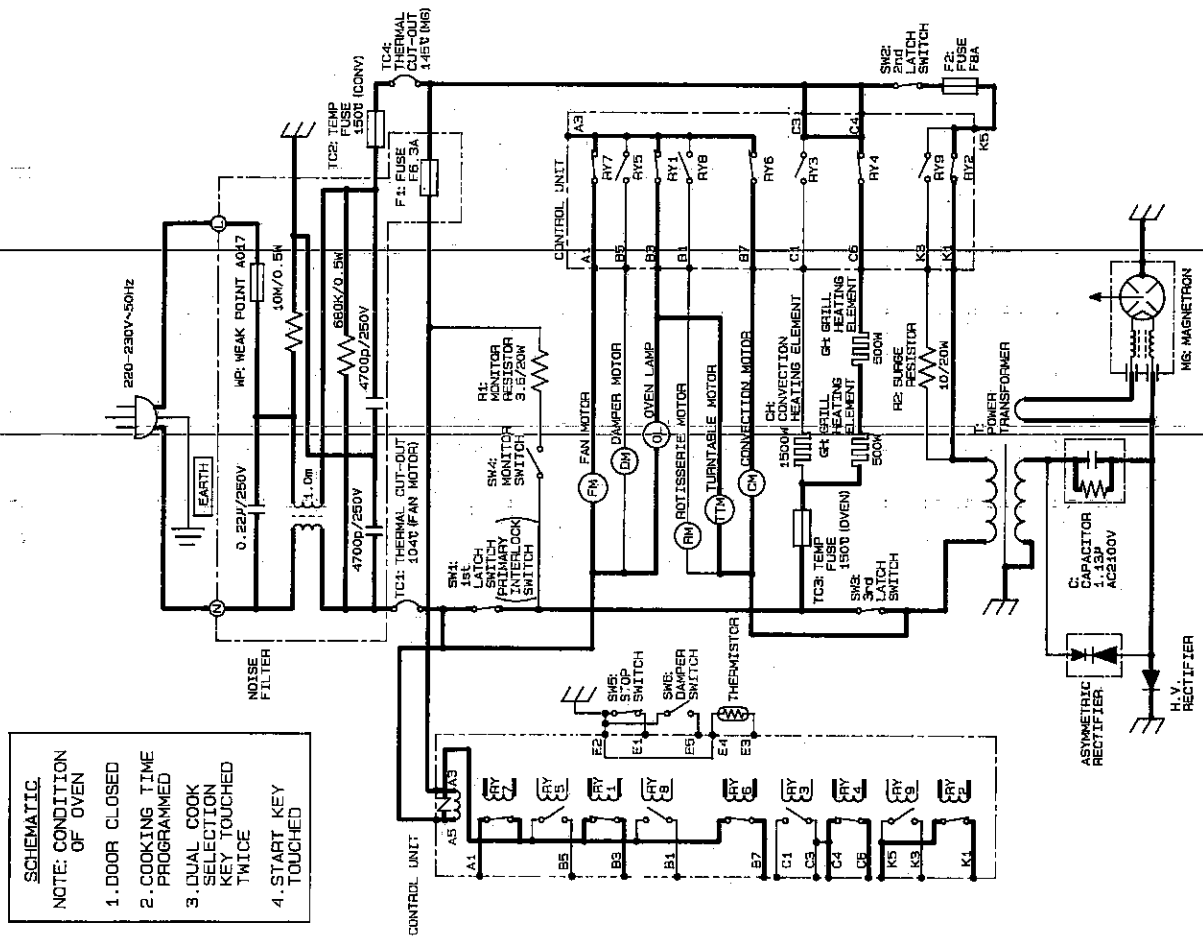


Figure O-6. Oven Schematic-Dual 2 Cooking (Microwave and Grill) Condition

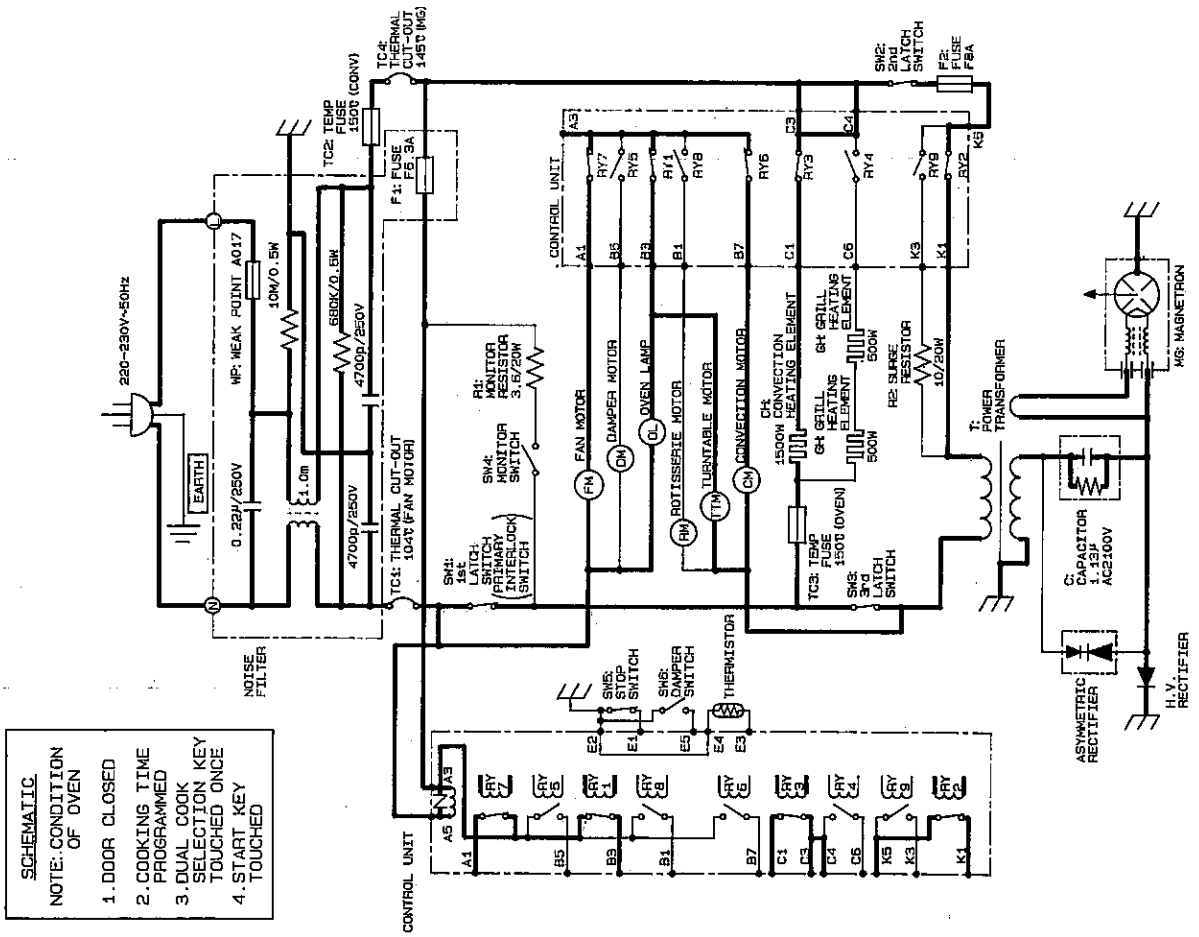


Figure O-5. Oven Schematic-Dual 1 Cooking (Microwave and Convection) Condition

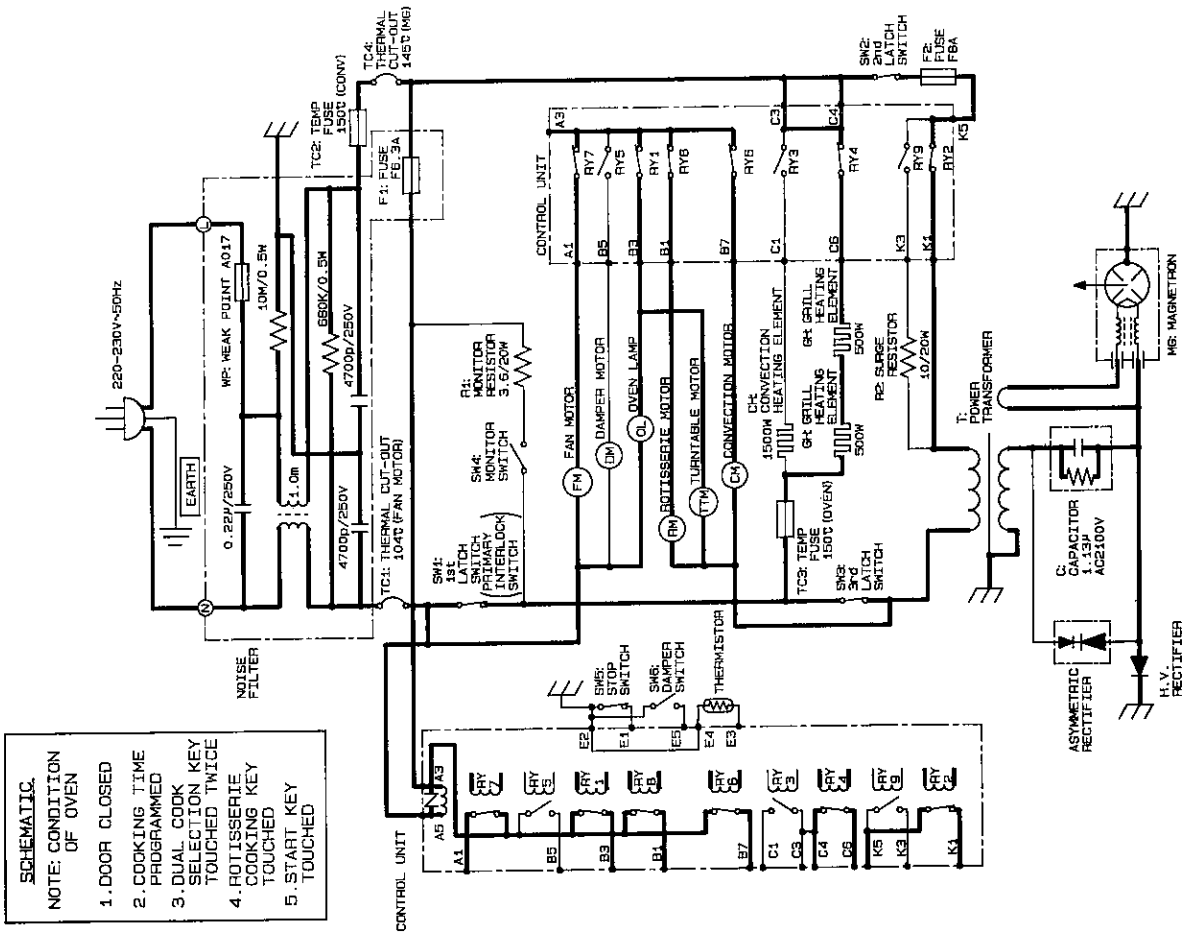


Figure O-7. Oven Schematic-Rotisserie Cooking Condition on Dual 2 Cooking (Microwave and Grill)

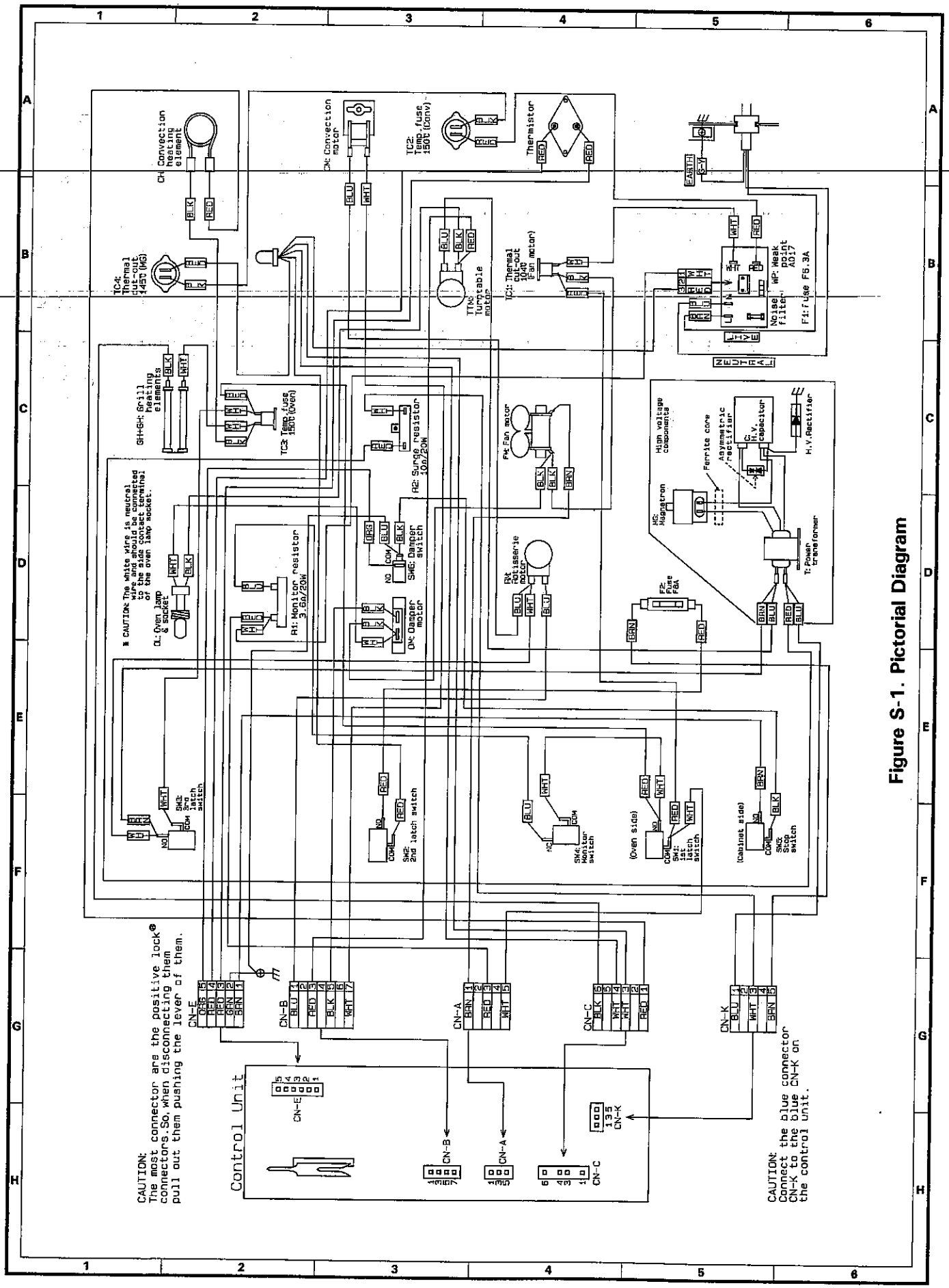


Figure S-1. Pictorial Diagram

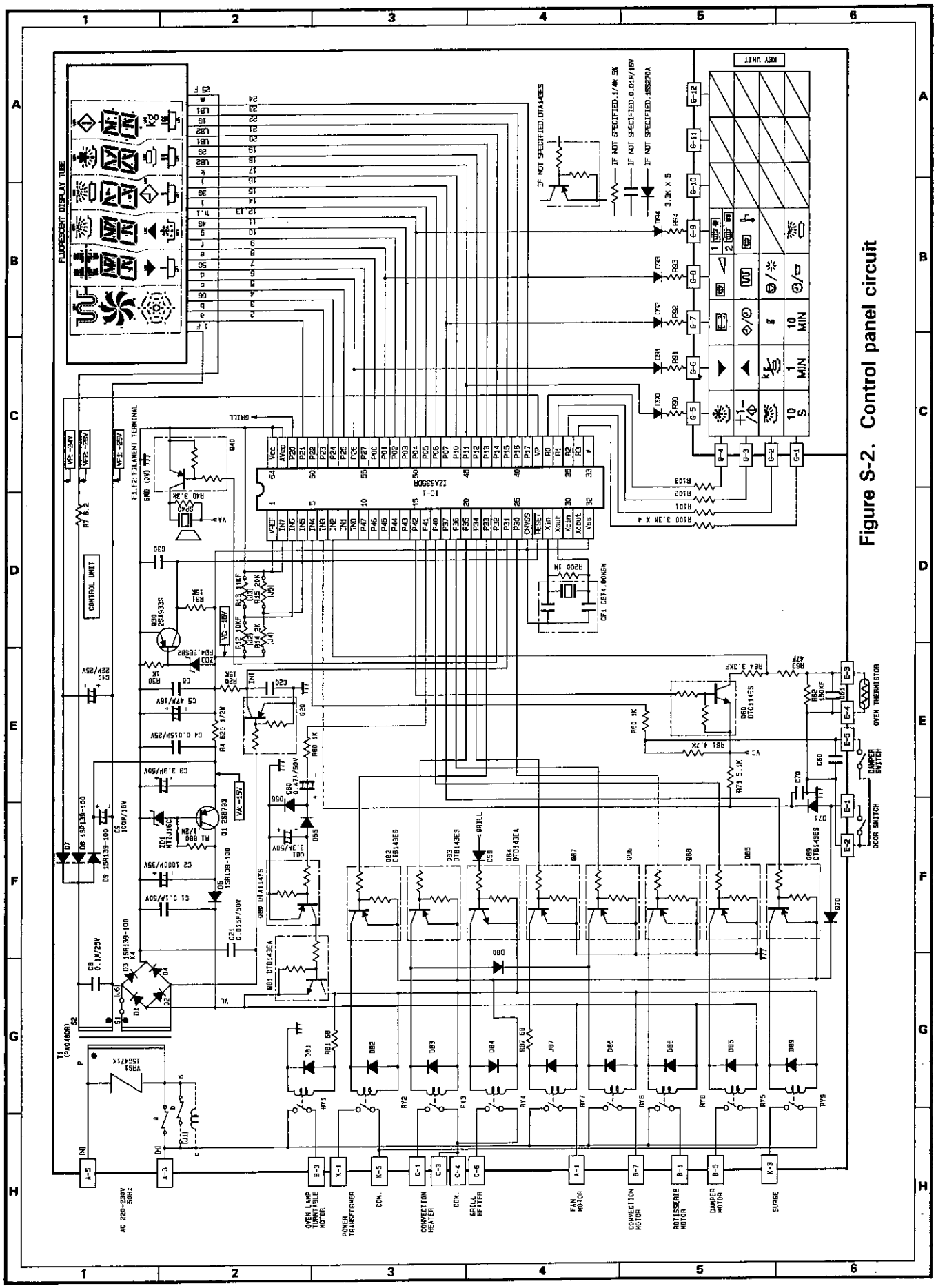


Figure S-2. Control panel circuit

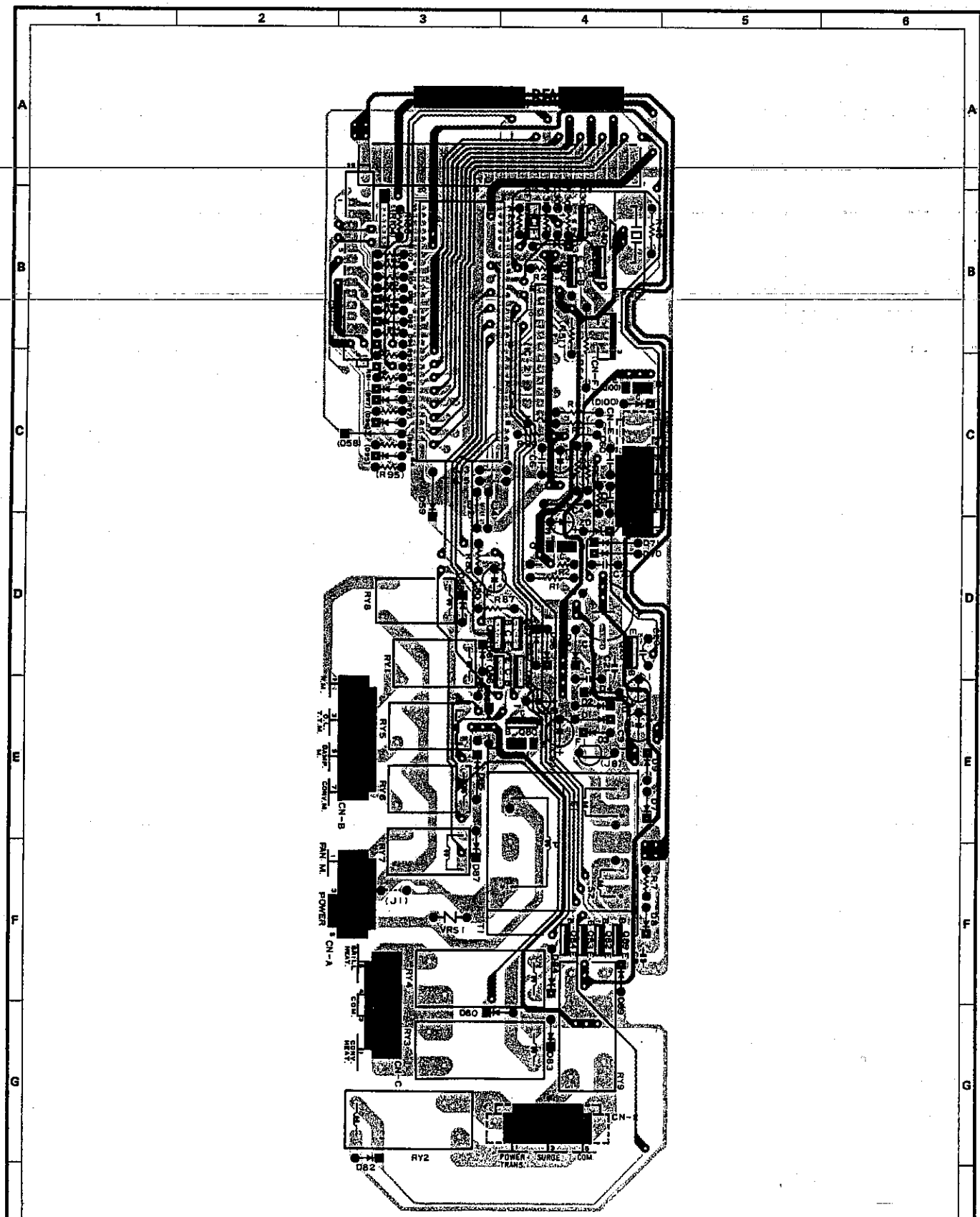


Figure S-3. Printed Wiring Board

Note : The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
C2	RC-EZA238DRE0	Capacitor 1000μF 35V	1	AD
C3,81	RC-EZA226DRE0	Capacitor 3.3μF 50V	2	AA
C4	VCKYB11EX153N	Capacitor 0.015μF 25V	1	AA
C5	RC-EZA229DRE0	Capacitor 47μF 16V	1	AB
C6,20, C30,60, C61,70	VCKYD11CY103N	Capacitor 0.01μF 16V	6	AA
C8	RC-KZ104QDRE0	Capacitor 0.1μF 25V	1	AB
C9	RC-EZA230DRE0	Capacitor 100μF 16V	1	AB
C10	RC-EZA228DRE0	Capacitor 22μF 25V	1	AB
C21	RC-KZA039DRE0	Capacitor 0.015μF 50V	1	AA
C80	RC-EZA227DRE0	Capacitor 0.47μF 50V	1	AA
CF1	RCRS-A010DRE0	Ceramic resonator (4.00MHz)	1	AD
D1-5, D8,9	VHD1SR139-11B	Diode (1SR139-100)	7	AA
D7, D55-56, D59, D70-71, D80-94,	VHD1SS270A/-1	Diode (1SS270A)	21	AA
IC1	RH-IZA335DRE0	LSI	1	AV
Q1	VS2SB793///-4	Transistor 2SB793	1	AC
Q20,40, Q85-88,	VSDTA143ES/1B	Transistor DTA143ES	6	AB
Q30	RH-TZA063DRE0	Transistor 2SA933S	1	AB
Q60	VSDTC114ES/-3	Transistor DTC114ES	1	AB
Q80	VSDTA114YS/-3	Transistor DTA114YS	1	AB
Q81,84,	VSDTD143EA/-4	Transistor DTD143EA	2	AC
Q82-83, Q89	RH-TZA097DRE0	Transistor DTB143ES	3	AC
R1	VRD-B12HF681J	Resistor 680Ω 1/2W	1	AA
R4	VRD-B12HF621J	Resistor 620Ω 1/2W	1	AA
R7	VRD-B12EF6R2J	Resistor 6.2Ω 1/4W	1	AA
R12	VRN-B12EK103F	Resistor 10kΩ(F) 1/4W	1	AA
R13	VRN-B12EK113F	Resistor 11kΩ(F) 1/4W	1	AA
R14	VRD-B12EF202J	Resistor 2kΩ 1/4W	1	AA
R15	VRD-B12EF203J	Resistor 20kΩ 1/4W	1	AA
R20,31	VRD-B12EF153J	Resistor 15kΩ 1/4W	2	AA
R30,60, R80	VRD-B12EF102J	Resistor 1kΩ 1/4W	3	AA
R40, R90-94, R100-103	VRD-B12EF332J	Resistor 3.3kΩ 1/4W	10	AA
R61	VRD-B12EF472J	Resistor 4.7kΩ 1/4W	1	AA
R62	VRN-B12EK154F	Resistor 150kΩ(F) 1/4W	1	AA
R63	VRN-B12EK470F	Resistor 47Ω(F) 1/4W	1	AA
R64	VRN-B12EK332F	Resistor 3.3kΩ(F) 1/4W	1	AA
R71	VRD-B12EF512J	Resistor 5.1kΩ 1/4W	1	AA
R81,87	VRD-B12EF680J	Resistor 68Ω 1/4W	2	AA
R200	VRD-B12EF105J	Resistor 1MΩ 1/4W	1	AA
RY1,5-7, RY8	RRLY-A020DRE0	Relay (OJ-SH-112LM)	5	AH
RY2,9	RRLY-A061DRE0	Relay (OMI-SH-112D,WHITE)	2	AK
RY3-4	RRLY-A013DRE0	Relay (OMI-SH-112D,BLUE)	2	AM
SP40	RALM-A007DRE0	Buzzer (PKM22EPT)	1	AF
T1	RTRNPA048DRE0	Transformer	1	AS
VRS1	RH-VZA010DRE0	Varistor (15G471K-T)	1	AE
ZD1	VHEMTZJ16C/-1	Zener diode (MTZJ16C)	1	AA
ZD3	RH-EZA105DRE0	Zener diode (RD4.3ESB2)	1	AA
3- 2	HPNLCA923WRR0	Control panel frame : R-8R51(W)	1	AM
	HPNLCA846WRR0	Control panel frame : R-8R51(B)	1	AP
3- 3	DUNTKA442WRK0	Key unit assembly : R-8R51(W)	1	AY
	DUNTKA441WRK0	Key unit assembly : R-8R51(B)	1	AY
3- 4	GMADIA044WRF0	Display filter	1	AD
3- 5	JBTN-A606WRF0	Open button : R-8R51(W)	1	AC
	JBTN-A328WRF0	Open button : R-8R51(B)	1	AC
3- 6	MSPRDA009WRE0	Open button spring	1	AA
3- 7	LANGTA248WRW0	Control panel back plate	1	AH
3- 8	MLEVFA042WRW0	Open lever	1	AC

Note: The parts marked "*" are used in voltage more than 250V

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
3- 9	NSFTTA030WRE0	Open shaft	1	AB
3-10	XEPSD30P10XS0	Screw; control unit mounting	3	AA
3-11	XCPSD40P10000	Screw; control panel back plate mounting	2	AA

OVEN PARTS

4- 1	FROLPA056WRY0	Roller stay assembly	1	AV
4- 2	NTNT-A040WRE0	Turntable	1	AZ
4- 3	PDUC-A219WRY0	Convection fan duct	1	AX
4- 4	LANGQA234WRW0	Convection motor mounting plate	1	AE
4- 5	LANGQA246WRW0	Fan thermo angle	2	AC
4- 6	NFANMA011WRP0	Convection fan	1	AD
4- 7	NFANMA012WRP0	Auxiliary fan	1	AC
4- 8	PFPF-A121WRE0	Convection thermal protection sheet	1	AN
4- 9	PGISHA017WRE0	Convection heater insulator (A)	2	AF
4-10	PGISHA018WRE0	Convection heater insulator (B)	1	AE
4-11	PPIPFA004WRE0	Collar	1	AE
4-12	PSLDHA084WRP0	Thermal-cover rear	1	AN
4-13	DOVN-A288WRY0	Oven cavity	1	BS
4-14	LBNDKA076WRP0	Capacitor holder	1	AG
4-15	FCOVQA004WRK0	Grill heater cover	1	AN
4-16	LANGQA286WRP0	Damper motor mounting plate	1	AD
4-17	MCAMPA055WRF0	Damper cam	1	AD
4-18	PSKR-A229WRP0	Partition plate T	1	AH
4-19	LANGQA240WRW0	Rotisserie motor angle	1	AK
4-20	NCPL-A034WRE0	Rotisserie coupling	1	AG
4-21	NFANJA025WRE0	Fan blade	1	AF
4-22	LANGQA285WRP0	Fan motor angle	1	AF
4-23	PDUC-A443WRP0	Fan duct	1	AL
4-24	LANGQA284WRW0	Oven lamp mounting plate	1	AF
4-25	LANGTA261WRP0	Chassis support	1	AD
4-26	LFLG-A012WRE0	Rotisserie bearing	1	AG
4-27	NCPL-A038WRE0	Coupling	1	AG
4-28	PCOVPA226WRE0	Waveguide cover	1	AC
4-29	PSKR-A208WRP0	Partition plate S	1	AD
4-30	PCUSGA291WRP0	Trans.cushion	1	AB
4-31	PCUSGA298WRP0	H.v.wire cushion	1	AB
4-32	PCUSUA252WRP0	Partition cushion L	1	AB
4-33	PCUSUA281WRP0	Partition cushion	1	AA
4-34	PDUC-A382WRP0	Steam duct	1	AK
4-35	PDUC-A441WRP0	Magnetron duct	1	AG
4-36	PDUC-A442WRP0	Intake duct	1	AG
4-37	PFPF-A135WRE0	Thermal protector sheet bottom	1	AG
4-38	PFPF-A136WRE0	Thermal protector sheet right	1	AM
4-39	PPACGA087WRE0	O-ring	1	AB
4-40	PSKR-A228WRP0	Thermal protector plate rear	1	AK
4-41	PSLDHA081WRW0	Thermal-cover grill	1	AG
4-42	PSLDHA095WRP0	Thermal protector plate right	1	AK
4-43	PSLDHA096WRP0	Thermal protector plate bottom	1	AH
4-44	MHNG-A107WRM0	Upper oven hinge	1	AE
4-45	PCUSGA287WRP0	Trans.cushion	1	AD
4-46	PDUC-A392WRP0	Exhaust duct	1	AH
4-47	QTANNA006WRE0	Short-plate	1	AB
4-48	MLEVPA082WRF0	Upper latch lever	1	AC
4-49	MLEVPA085WRF0	Lower latch lever	1	AD
4-50	PHOK-A030WRF0	Latch hook	1	AL
4-51	PZETEA050WRE0	Insulation sheet	1	AA
4-52	PGLSPA255WRE0	Oven lamp screen glass	1	AE
4-53	PCUSU0265WRP0	Steam duct cushion	1	AD
4-54	PCUSGA284WRP0	Cushion	2	AA
4-55	PCUSUA282WRP0	Thermal cover bottom cushion	1	AB
4-56	PCUSUA283WRP0	Partition cushion Top	1	AC
4-57	PCUSUA285WRP0	Partition cushion	1	AB
4-58	PSKR-A239WRP0	Intake duct protector plate	1	AC
4-59	LANGQ0382WRM0	Earth angle	1	AB
4-60	PCUSGA023WRP0	Cushion	1	AA

Note : The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
		DOOR PARTS		
5	CDORFA481WRK0	Door assembly, complete (R-8R51W)	1	BM
	CDORFA485WRK0	Door assembly, complete (R-8R51B)	1	BN
5- 1	DDORFA399WRY0	Door panel	1	BG
5- 2	FCOVHA025WRK0	Choke cover	1	AV
5- 3	GWAKPA178WRF0	Door frame (R-8R51W)	1	AT
	GWAKPA149WRF0	Door frame (R-8R51B)	1	AU
5- 4	HDECQA158WRF0	Door sash right (R-8R51W)	1	AH
	HDECQA149WRF0	Door sash right (R-8R51B)	1	AG
5- 5	LSTPPA086WRF0	Latch head	1	AE
5- 6	MSPRTA109WRE0	Latch spring	1	AA
5- 7	PGLSPA294WRE0	Door glass (R-8R51W)	1	AZ
	PGLSPA299WRE0	Door glass (R-8R51B)	1	AY
		MISCELLANEOUS		
6- 1	TCADCA346WRR0	Cookbook for convection and grill cooking	1	AR
6- 2	TCADCA347WRR0	Cookbook for microwave cooking	1	AU
6- 3	TINS-A236WRR0	Operation manual in german, french and dutch	1	AH
6- 4	TINS-A237WRR0	Operation manual in italian and spanish	1	AH
6- 5	TLABMA287WRR0	Menu label for white model	1	AF
6- 5	TLABMA289WRR0	Menu label for brown model	1	AB
6- 6	TLABMA290WRR0	Easy reheat and easy defrost label	1	AF
6- 7	FAMI-A048WRM0	High rack	1	AP
6- 8	FAMI-A054WRM0	Low rack	1	AP
6- 9	JHNDMA028WRT0	Handle (Left)	1	AK
6-10	JHNDMA027WRT0	Handle (Right)	1	AK
6-11	PGISHA054WRE0	Ceramic skewer support	1	AG
6-12	FSRAGA002WRK0	Baking-tin	1	AU
6-13	FW-VZA964WRE0	Low voltage wire harness	1	AQ
6-14	FW-VZA965WRE0	Main wire harness	1	BA
6-15	TSPCNB404WRR0	Name plate for R-8R51(W)	1	AA
6-15	TSPCNB411WRR0	Name plate for R-8R51(B)	1	AA
6-16	TCAUHA082WRR0	Caution label	1	AC
6-17	TCAUHA083WRR0	Belgium label	1	AB
6-18	LANG-A029WRM0	Slide prongs	2	AE
6-19	NSFTTA073WRE0	Skewer	1	AQ
6-20	LBNDK0018JBE0	Wire tie	1	AA
6-21	QW-QZA160WRE0	High voltage wire C	1	AD
		SCREW, NUTS AND WASHERS		
7- 1	LX-NZ0061WRE0	Special nut	3	AB
7- 2	XBPSD40P22000	Screw; 4mm x 22mm	2	AA
7- 3	XBTSD40P05000	Screw; 4mm x 5mm	4	AA
7- 4	XBTWW40P12000	Screw; 4mm x 12mm	2	AA
7- 5	XCBWW30P08000	Screw; 3mm x 8mm	2	AB
7- 6	XHPSD30P06000	Screw; 3mm x 6mm	4	AA
7- 7	XCPWW30P12X00	Screw; 3mm x 12mm	4	AA
7- 8	XCTWW40P12000	Screw; 4mm x 12mm	2	AA
7- 9	XNEUW40-32000	Nut; 4mm x 3.2mm	1	AA
7-10	XPSSP20-20000	Pin;	1	AA
7-11	XWHUW40-08000	Washer; 4mm x 0.8mm	2	AA
7-12	XWHUW50-08000	Washer; 5mm x 0.8mm	1	AA
7-13	XWSUW40-10000	Washer; 4mm x 1.0mm	1	AA
7-14	XHPSD40P06000	Screw; 4mm x 6mm	2	AA
7-15	XHPSD40P08K00	Screw; 4mm x 8mm	2	AA
7-16	XCPSD30P16X00	Screw; 3mm x 16mm	1	AA
7-17	XHPSD40P08000	Screw; 4mm x 8mm	7	AA
7-18	XHTSD40P08000	Screw; 4mm x 8mm	7	AA
7-19	XOTSD40P08000	Screw; 4mm x 8mm	25	AA
7-20	LX-BZA061WRE0	Special screw	2	AC
7-21	LX-BZA088WRE0	Special screw	1	AC
7-22	XHTSD40P12RV0	Screw; 4mm x 12mm	1	AA
7-23	LX-CZ0052WRE0	Special screw	4	AA
7-24	LX-EZA042WRE0	Special screw	2	AB
7-25	XBPWW30P05K00	Screw; 3mm x 5mm	2	AA

Note : The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
7-26	XBTWW40P06000	Screw; 4mm x 6mm	3	AA
7-27	XCPSD30P10000	Screw; 3mm x 10mm	1	AA
7-28	XCTWW40P06000	Screw; 4mm x 6mm	1	AA
7-29	XHTSD40P08RV0	Screw; 4mm x 8mm	3	AA
7-30	XOTSD40P10RV0	Screw; 4mm x 10mm	4	AA
7-31	XWHSD40-08160	Washer	1	AA
7-32	XHSSC40P08000	Screw; 4mm x 8mm (R-8R51W)	1	AA
	XHSSB40P08000	Screw; 4mm x 8mm (R-8R51B) EHKE 199	1	AA
7-33	LX-CZA020WRE0	Special screw	5	AA
7-34	LX-CZA038WRE0	Special screw	2	AA
7-35	XOTSC40P12000	Screw; 4mm x 12mm (R-8R51W)	4	AB
	XOTSB40P12000	Screw; 4mm x 12mm (R-8R51B) EHKE 199	4	AA
7-36	XOTSD40P12000	Screw; 4mm x 12mm	5	AA
7-37	XCbSD30P06000	Screw; 3mm x 6mm	8	AA
7-38	XWHSD40-20120	Washer; 4mm x 20mm	2	AA
7-39	XCPSD40P06000	Screw; 4mm x 6mm	3	AB
7-40	LX-BZA059WRE0	Special screw	2	AA
7-41	XBPSD30P26K00	Screw; 3mm x 26mm	2	AA
7-42	XNESD30-24000	Nut; 3mm x 2.4mm	2	AA
7-43	XWVUW40-04000	Washer; 4mm x 0.4mm	2	AA

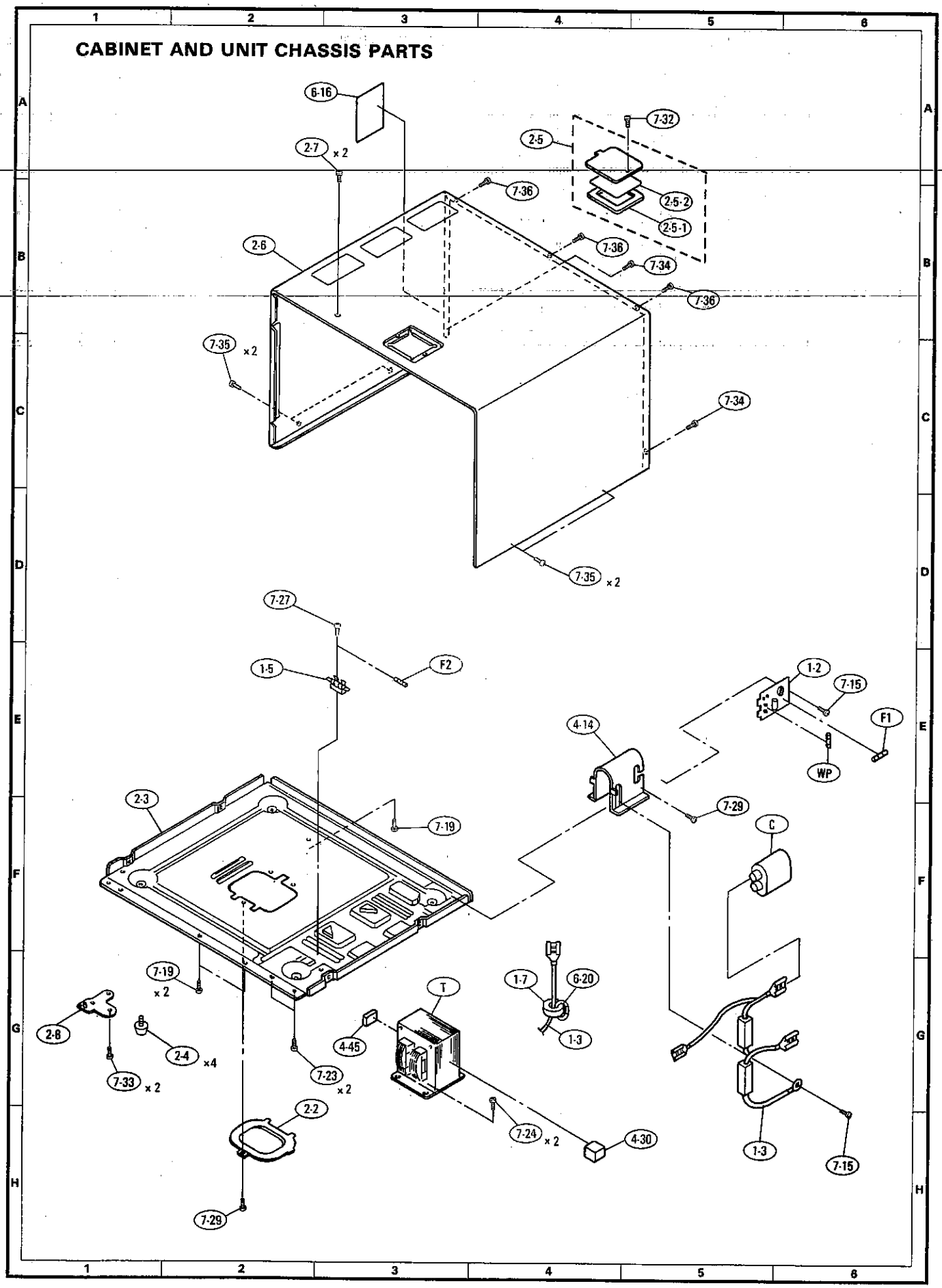
HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

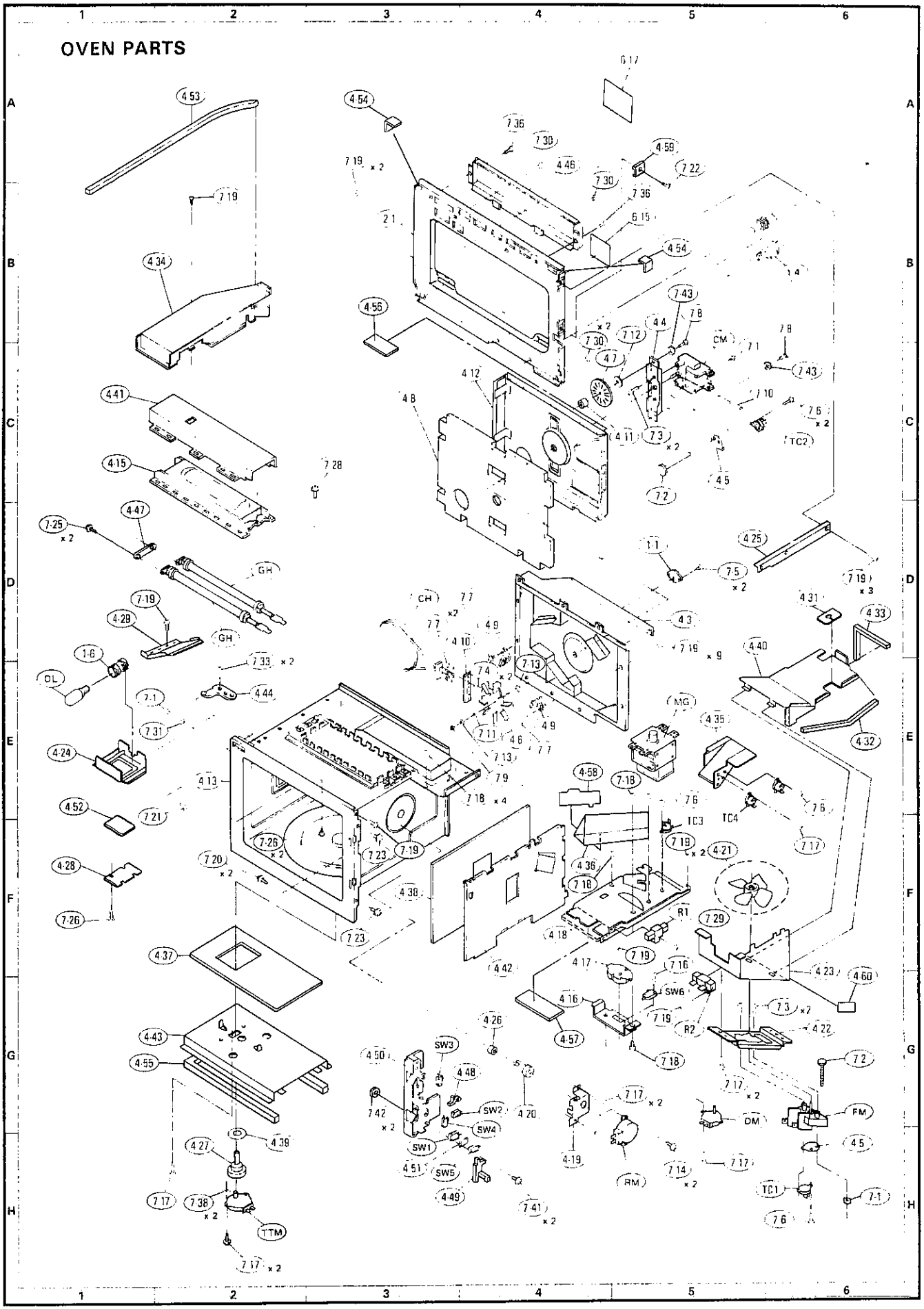
1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

(RDP1303U)

CABINET AND UNIT CHASSIS PARTS



OVEN PARTS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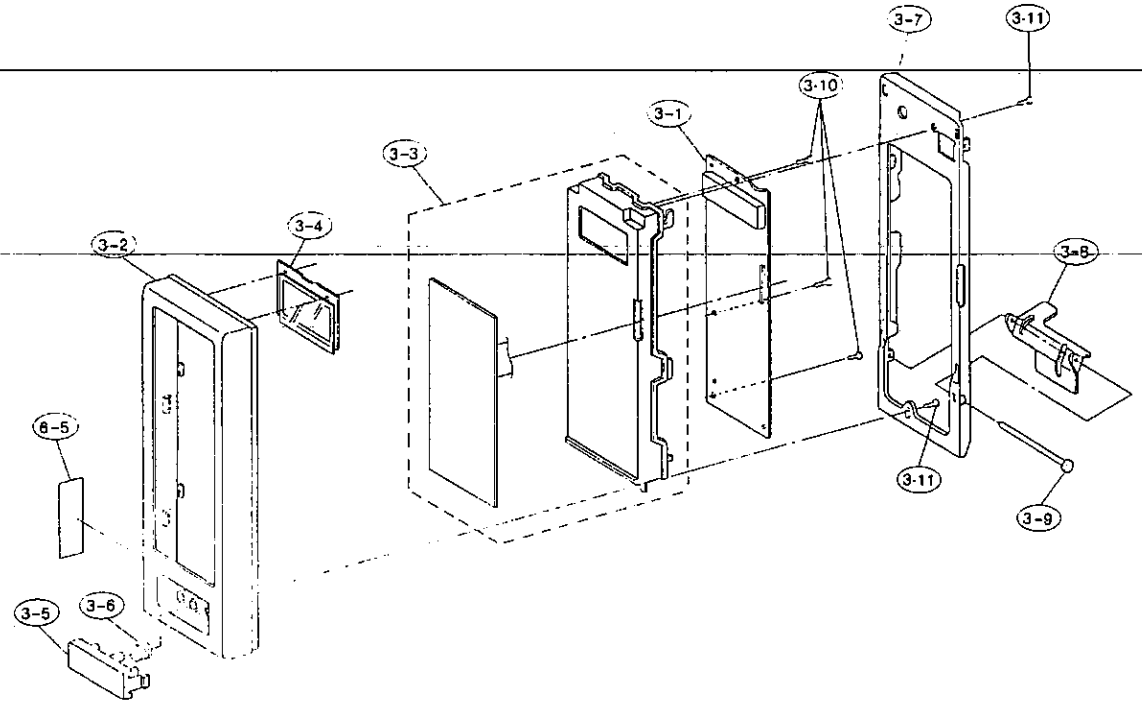
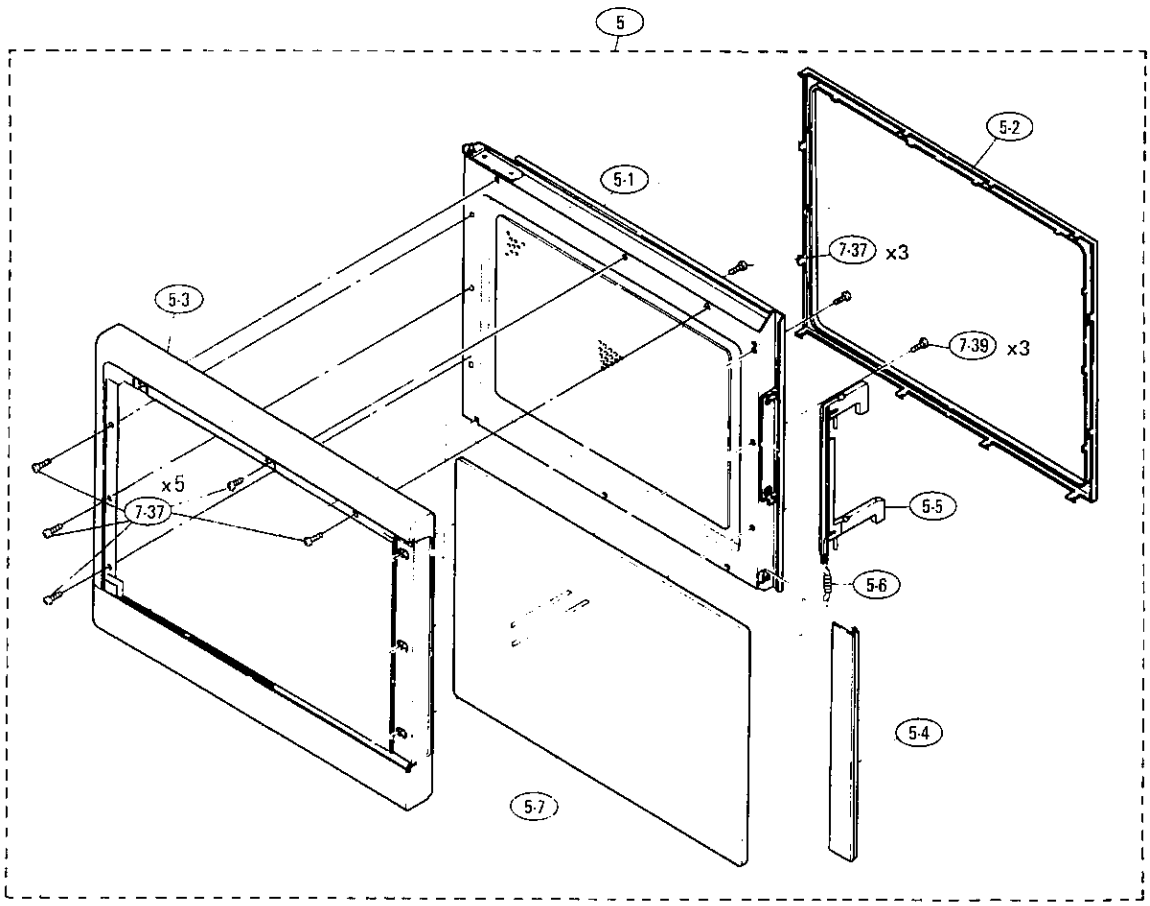
CONTROL PANEL PARTS



DOOR PARTS



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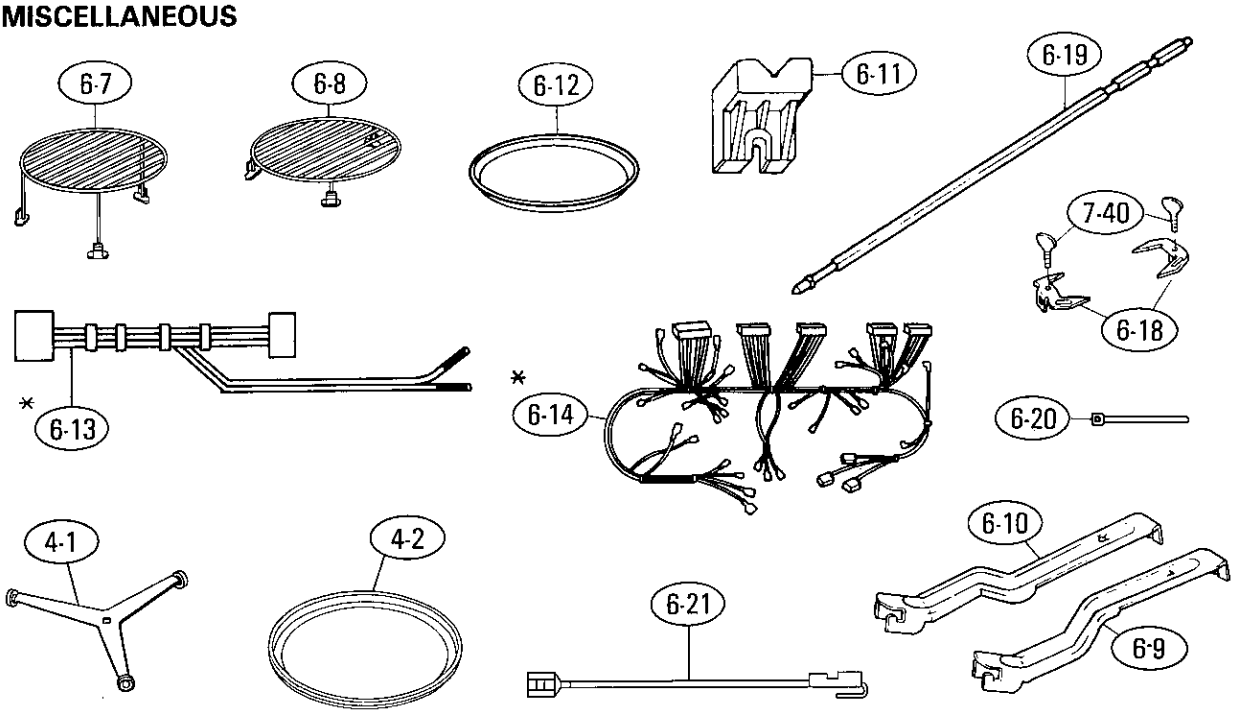
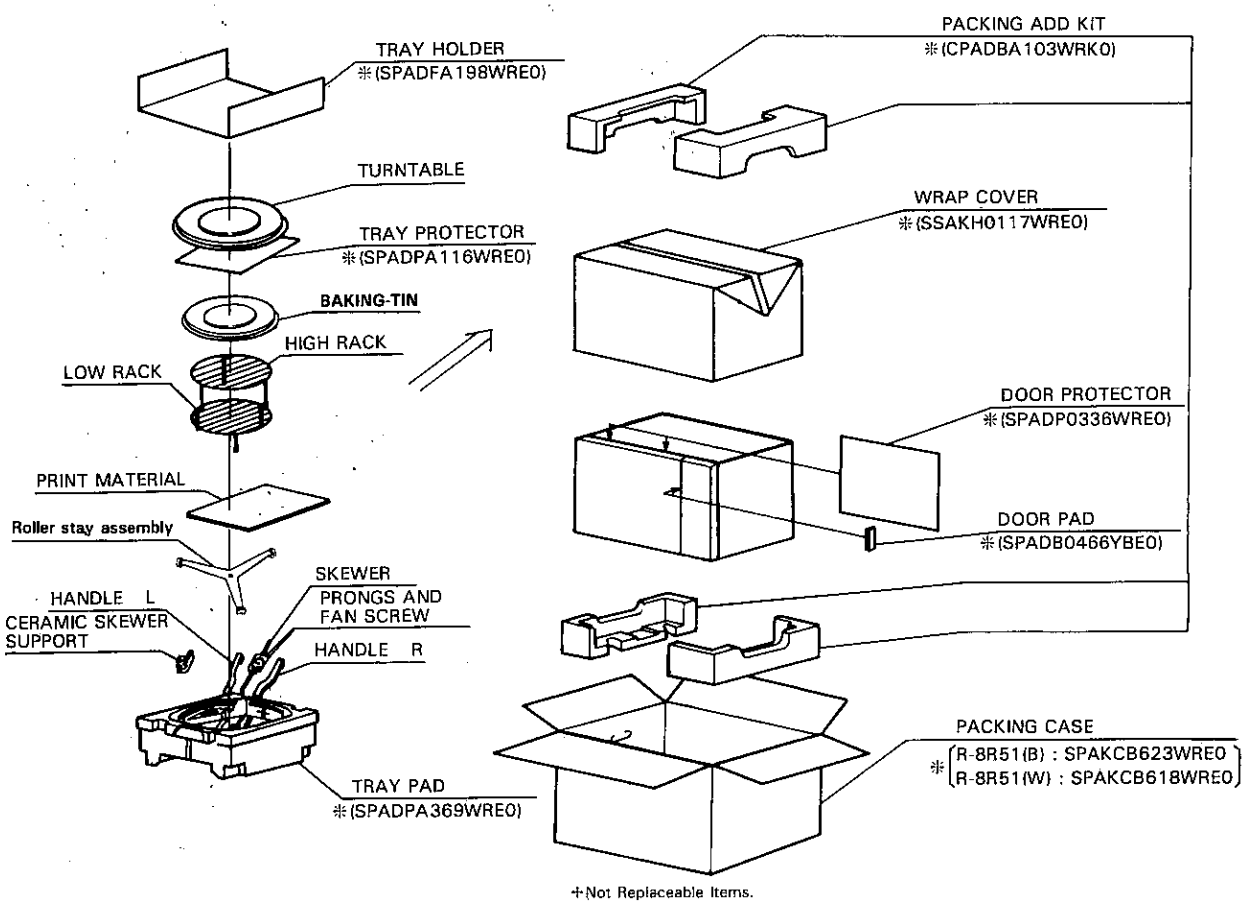


PACKING AND ACCESSORIES



+Not Replaceable Items.

R-8R51(W)
R-8R51(B)

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